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THE POWER OF PUBLIC OPINION--- THE HOLDING COMPANY

Public opinion is a mighty power. What the majority of the people really want, and want hard enough, they get—and it doesn't require a national election to demonstrate that fact, either.

This was proved in Indiana just the other day when the public service commission decided there could be two telephone companies competing for business in the town of Versailles. It was contrary to the established principle which seeks to prevent unnecessary duplication of service; but the public demanded access to a farmers' mutual system, and the commission granted the rural company permission to locate an exchange in the town, although a local plant was already serving the community.

The people demanded that this action be taken, and public opinion carried the day even though it upset the general practice of "one company to a town." The incident illustrates the tremendous weight of public demand, and emphasizes the importance of service companies gaining and keeping the good will of the people.

* * * *

Of course, under proper conditions the two companies should have been able to agree on a plan whereby there would be only one company operating in the territory. Elimination of duplicated service is now recognized generally as the only satisfactory economic plan, and eventually this will probably result in the Versailles district. The peculiar development of a state commission ordering a return to competition is cited simply as a striking proof of the tremendous power of public opinion. When the people make up their minds they want a thing, they get it and that's all there is to it.

* * * *

What led up to this odd situation was that the farmers in Ripley county organized a mutual telephone company in 1927 as a protest against what they claimed were the too high rates of the Versailles Telephone Co., which operates in the town. The mutual company petitioned the commission for the right to establish its own exchange in Versailles last March, but the commission denied the petition.

The rural line service prospered, and then the residents of the town joined in support of a re-application for permission to install the exchange. This was heard recently, with the result that the commission changed its mind, decided to listen to "vox populi" and granted the certificate of convenience so there can be two exchanges in the same town, regardless of precedent.

Being responsible for such a situation, which can only work hardship to both service companies and cause the telephone-using public trouble and annoyance, it would seem to be the duty of the commission to adjust the differences between the competing companies so that conditions conform to the general policy of one exchange to a town.

Good will is a familiar topic at this season of the year when the changes are beginning to be rung on Christmas greetings. It is the good will that a service company builds up in its contact with its patrons that enables it to profit from an expression of public opinion—or else to suffer from it if the good will is lacking.

"What a fine thing it would be if we could acquire a big stock of good will, store it in a warehouse and draw on it as we need it," said a manufacturer who was showing a visitor through his factory and calling attention to the various lines of goods ready for shipment.

Of course, that can't be done with an intangible commodity like good will. The manufacturer, the public service company, and, in fact, every business concern, must create that good will asset day after day, and distribute it just as regularly, if it is to bring in material returns. That is the strange thing about the good will of the utility that has the right kind of public relations—namely, that good will is intangible but its effects are undoubtedly material.

* * * *

In trying to build good will through newspaper publicity, that section of the public utility industry which ran afoul of the Washington investigators is urging that more care be taken regarding the material given to the press in the future. The Federal Trade Commission is preparing to resume raking over the power companies' records with a view to determining how far they went in fighting government own-

ership, what was the effect, and if their efforts were unethical.

As stated before, the telephone industry was not directly involved in the previous investigation which was principally aimed at the activities of various state committees on public utility information, although telephone associations in some states were represented on the committees.

Should the utility investigation lead up to legislation providing for regulation of holding companies, however, the telephone business may have more of an interest in the proceedings. The holding companies controlling operating telephone corporations —including the American Telephone & Telegraph Co. would, it is expected, be among the business organizations which the government regulators would plan to supervise.

* * * *

At the New Orleans convention of the National Association of Railroad & Utilities Commissioners, one of the committees reported that all holding companies should be defined as public utilities when their operations affect the activities and control of operating companies. It was further urged that there should be regulation of contracts for service between holding and operating companies, and that the vigorous opposition of the holding concerns to this regulation in past years had not tended to create public confidence.

In the telephone field the most prominent holding company—the A. T. & T. Co.—has resisted state commissions that attempted to exercise regulatory authority, and this has led to much litigation in several states. In Michigan, this took the shape of an attempt to forfeit the charter of the corporation for refusing to recognize the authority of the state commission. Generally speaking, the commissions contend that if they regulate the child—the operating unit—they should also regulate the parent, the holding company.

* * * *

Coming back to the more careful censoring of press utility material, an editorial in the December 1 issue of the Gas Age-Record, entitled, "Just What Is News?" strongly urges service companies to stick to the facts in whatever they submit for publication.

"Few general topics should be of more interest to the average reader than news regarding the public utilities," says one paragraph. "On them the public relies for its comfort and convenience; without them the public would be in a position where living almost ceased to be worthwhile. Imagine the United States today without gas, electric light, transportation facilities or the telephone.

"Though they are the greatest benefits of this modern civilization, news of their activities should be released only through strainers of the finest mesh. The very power of the public utilities makes them targets for public criticism. News of their activities should contain 'the truth, the whole truth and nothing but the truth,' otherwise it is without value and will do more harm eventually than no news at all."

* * * *

The editorial goes on to say that there are too many press agents in the world today, and that too many of them are doing their employers more harm than good by their unwise tactics. The advice is then given that all business concerns should select their publicity directors with the same care that they select their treasurers.

All of which is true, no doubt, and it is gratifying to testify that so far as the telephone industry is concerned, its publicity efforts have not been adversely criticised for many years past. The telephone is so close to the people that all it needs to ask is that the plain unvarnished truth be told of the essential service it renders the public; that's not difficult.

COMING CONVENTIONS.

South Dakota Telephone Association, Sioux Falls, Cataract Hotel, January 15, 16 and 17.

Arkansas Telephone Association, Little Rock, Marion Hotel, January 21 and 22.

Minnesota Telephone Association, St. Paul, Hotel Lowry, January 22, 23 and 24.

Nebraska Telephone Association, Lincoln, Hotel Lincoln, February 13, 14 and 15.

Texas Independent Telephone Association, Ft. Worth, Texas Hotel, March 25, 26, 27 and 28.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, April 16, 17 and 18.

Indiana Telephone Association, Indianapolis, Claypool Hotel, May 7, 8 and 9.

Requirements for Telephone Operators

Successful Force Management a Necessary Part of Furnishing Good Service to the Public—Operators Reach 100 Per Cent Efficiency at End of 16th Month—Paper Presented Before Traffic Conference of National Convention

By W. I. Howard,

Traffic Superintendent, Tri-State Telephone & Telegraph Co., St. Paul, Minn.

The operation of an exchange system is for the purpose of furnishing the public with good intercommunication and incidentally to make a profit for those who have put their money in the telephone business. The establishing of intercommunication must meet the expectation of the public in speed and accuracy, and to meet the expectation of the stockholders it must be accomplished economically.

The cost to operate an exchange system is divided into four major items of expense—maintenance, traffic, commercial, and general and miscellaneous expense. In a manual system, approximately 35 per cent of the total operating cost is chargeable to traffic; and when we analyze the traffic expense we find that approximately 75 per cent of it goes for operators' salaries and operators' schooling.

It is evident then that the management of our operating room forces is a vital part of the business of giving good telephone service at reasonable cost.

The first requirement in proper force management is a knowledge of the size of the job to be handled so as to provide an adequate force of people to handle it. It is of prime importance that these forces be maintained and stabilized insofar as possible and insured by the employment of a sufficient number of additional people to take the place of those who are absent,

those who must be given days off for Sunday work, to relieve members of the regular force during vacations, and to replace losses.

The size of the job to be handled by the operating force is represented by the volume of traffic flowing through the office at different hours of the day; and the size of the force required to handle it depends upon the efficiency of those employed. Successful force management requires the assignment of enough operating labor each hour of the day to handle the volume of traffic that occurs without an excess of labor at any time except that necessary in applying reasonable tours of duty, and the force insurance already mentioned.

The disposition of a call passing through the office takes a certain amount of an operator's time; and a knowledge of the number of calls that may reasonably be expected to occur at any hour, as shown by records of past performance, will permit the placing of a sufficient number of operators at all times to handle the traffic providing we know each operator's capacity for handling the work. Consideration must always be given, of course, to the possibility of abnormal loads occurring because of special conditions and circumstances that may not be foreseen except shortly before they occur.

The handling of a call from one subscriber to another in the same office through the line multiple on a lamp-signal, single answering-jack switchboard requires one unit of labor or 15.65 seconds of an operator's time. Classes of calls which require more or less performance on the part of the operator, or on types of switchboards more or less efficient, will take more than a unit or less than a unit as the case may be. With these factors determined and having a record of the calls passing through the office at different hours of the day, the traffic is readily converted to units of labor, and the operators required to handle it at any time will be the number whose aggregate capacity will equal it.

An operator in a single-office exchange of five or more switchboard positions is expected to have an efficiency of about 56 per cent at the end of the first month of work at the switchboard. At the end of the second month of service she is expected to have an efficiency of 74 per cent; at the end of the third month an efficiency of 81 per cent and so on until at the end of the tenth month she reaches 100 per cent efficiency.

An operator at 100 per cent efficiency is capable of performing 230 such labor units each hour for several hours without tiring and give a good grade of service; that is, she could satisfactorily handle 230 calls from one subscriber to another in the office under consideration.

An operator with one month's experience on the board having an efficiency of 56 per cent could be expected to handle only 129 of such calls an hour, and it would require approximately two such operators to handle the same amount of traffic the 100 per cent efficient operator would handle.

In multi-office exchanges, the operator is only 39½ per cent efficient at the end of the first month, because of the more complicated requirements of operating, and she does not reach 10 per cent efficiency until the end of the 16th month.

It will be seen from the foregoing that it is as an important part of the force

"The Management of Our Operating Room Forces," Says Mr. Howard, "Is a Vital Part of the Business of Giving Good Telephone Service at Reasonable Cost."

management to keep the force stabilized insofar as possible because of the greater efficiency of the girls of longer experience, and every reasonable precaution should be taken to prevent resignations. The resignation of an operator of 100 per cent efficiency would require the employment of two 56 per cent efficient girls to handle her work, and it wouldn't be done as satisfactorily in expense or service.

Increased operating efficiency means fewer people required to handle the loads, the central office equipment becomes more efficient, and less switchboard equipment is required, although it must be available as an insurance against the time when the efficiency of the force is low through turnover. Speaking in terms of money, the loss of an operator of average ability in an exchange the size of Saint Paul costs the telephone company about $1,000.

The labor turnover in the operating force is so important a factor that in the larger offices the management goes to great lengths to make the operating positions attractive. The scale of pay is made as high as possible; modern cafeteries are made available, where the girls may obtain good wholesome food at cost; well-furnished restrooms are provided, and reading materials, radio sets, pianos, phonographs and other forms of diversion are furnished.

Medical departments are also provided to guard their health, and funds are set aside that their pay may continue while they are absent because of sickness or accident. They are given vacations without loss of pay and are allowed pensions and death benefits—all of which are means towards retaining their services for the company.

Successful force management requires a constant attention to working conditions, particularly in the assignment of hours of duty. These should be as nearly regular and as unobjectionable as possible, consistent with the requirements of the office, to protect the health of the employe and make her employment satisfactory to her.

The assignment of hours that will interfere with regular meal periods of sufficient duration, or hours that will be unreasonable considering the employe's activities while off duty, should be avoided insofar as possible. The assigning of irregular hours should be carefully scrutinized by the supervisory people that they may assure themselves that the employe is not thereby placed in an unhealthful or disagreeable tour of duty that will eventually cause trouble.

Afternoon-evening tricks ending after 10 p. m. are undesirable but may be necessary where the force is not sufficient to handle the traffic after 10 p. m.

Morning-afternoon, afternoon-evening and morning-evening tricks should not be more than eight hours' duration including relief periods except for lunch, in multi-office exchanges and in all but the smaller single-office exchanges.

Short-hour tricks should not be less than four nor more than five hours including relief periods, except that six hours may be permissible for night operators.

Night tricks should not exceed ten hours including relief and lunch period and should come within the hours of 10 p. m. and 7 a. m.

A short-hour trick should be a continuous shift if it does not exceed five hours. If the trick is for a longer period, it should be divided into two shifts.

Lunch periods should not be less than one hour nor more than two hours between two shifts of morning-afternoon and afternoon-evening operators.

Lunch periods for morning-afternoon operators should not begin earlier than 11 a. m. nor extend later than 2 p. m. For afternoon-evening girls the lunch period should begin not later than 4 p. m. nor end later than 7:30 p. m., and night operators should be assigned lunch periods as near the middle of their shift as possible.

In offices having 15 or more operators and in smaller offices wherever possible, regular relief periods of 15 minutes should be granted within each shift of three hours or more duration; and curtailment of this

regular relief should be avoided except under extraordinary circumstances that make it necessary in order to maintain the service.

These relief periods should not occur less than one hour from the beginning or ending of the shift in which it is scheduled and should be assigned as near the middle of the shift as may be.

When fixed schedules are applied, the operators newest in the force should be assigned to tricks involving evening hours, giving due consideration to providing an evening force composed of operators of sufficient experience to properly maintain the service. Where it is possible to do so, night forces should be selected from those who will volunteer for the work.

In the assignment of tricks careful attention should be given to the operator's preferences for certain tricks wherever it is consistent with the proper handling of the service, and seniority given preference in concessions of this kind.

No operator should be required to work more than six days a week, except in the very small exchange where it may be necessary because of the slight demand upon her time for actual work.

The entire operating force should be called upon to take their turn at working Sunday tricks and allowed time off during the week when they are scheduled to work on a Sunday.

Because of the necessity of giving 24-hour service every day of the year, there are many undesirable periods during which we must ask the operators to be on duty, and on that account we should be continually on the alert to grant every reasonable request they may make if by so doing the office may be properly handled.

When we consider the fact that three-fourths of the entire traffic expense in manual offices is expended on the operating force and that the satisfaction of the service and the cost to give it depend upon them, it is obvious that every detail and phase of their management is worthy of careful study and attention.

Telephone Connections Between European Countries; with U. S.

The October issue of Europäischer Fernspreichdienst contained the interesting chart published on this page, which shows 135 telephone connections between various European countries and states, representing one-third of the potential 406 connections.

	Albania	Austria	Belgium	Bulgaria	Czechoslovakia	Denmark	Danzig	Estonia	Finland	France	Germany	Great Britain	Greece	Hungary	Italy	Jugo-Slavia	Latvia	Lithuania	Luxemburg	Netherlands	Norway	Poland	Portugal	Rumania	Russia	Sweden	Switzerland	Spain	Turkey
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Switzerland#		*	*		*	*	*			*	*	*		*	*			*			*	*	*				*			
Spain #										*	*	*												*					
Turkey																													

Telephone Connections Between European Countries. The United States Has Connections With Countries Whose Names in First Column Are Followed by a Symbol.

In addition to these connections shown, 11 new circuits are under construction and more than 40 under consideration.

The United States has telephone connection with 14 of these countries (denoted by (*) in the first vertical column) and, in addition, with Canada, Cuba and Mexico.

Suggests Centralizing Regulation of Communications.

A bill to extend the life of the Federal Radio Commission for another year will be introduced in the House by Representative White, chairman of the Merchant Marine Committee and co-author of the radio act of 1927.

Mr. White stated last week that he was opposed to making the radio commission a permanent body, believing that all government agencies dealing with communications, either in a regulatory or administrative capacity, should be merged into one department with representation in the Cabinet.

Under present authority, in the absence of action by Congress, the radio commission would cease to function as an administrative body on February 23, after which it would act only as an appellate organization.

The White bill will provide that the commission shall continue its administrative work until February 23, 1930.

"At the present time," said he, "the Interstate Commerce Commission has a definite jurisdiction over telephones, telegraphs, cables and radio; the State Department, by the cable-landing license act, was also given a measure of jurisdiction over cables; the Department of Commerce has an authority over radio, and we have the radio commission with the powers conferred by the 1927 act.

"In addition to these four governmental agencies, several of the departments of the government have their systems of wire and radio communication.

It seems to me that we must ultimately establish a communications service in which shall be centered the scattered and conflicting power and authority now exercised by these different governmental agencies over privately-owned facilities and upon which we must place responsibility so far as the government is responsible in the premises.

I think a temporary radio commission can hereafter be abolished or merged more easily in the single unit of government which I have in mind than a commission designated and regarded as permanent."

Motor Vehicles Equipped with Labor-Saving Devices.

In the article entitled "Motor Vehicles; Labor Saving Devices," which appeared on pages 24 and 25 of last week's pages of TELEPHONY, through an error, no reference was made to the company using the various devices described. The article was written by S. B. Williams, general results supervisor of the Bell Telephone Co. of Pa., Philadelphia, Pa., and the equipment referred to is all in use by that company.

Prices in the Metal Markets.

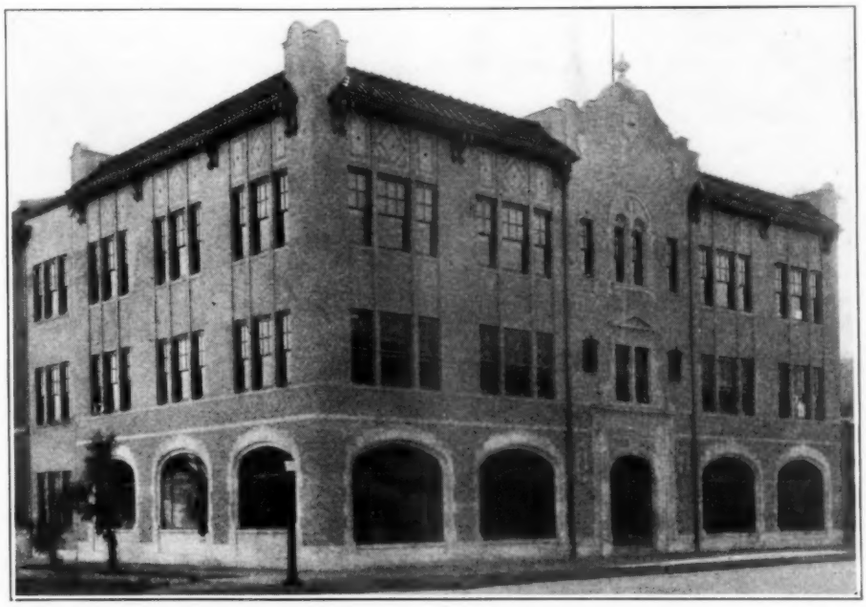
New York, December 10.—Copper—Steady. Electrolytic, spot and future, 16c. Iron—Firm; No. 2, f. o. b. eastern Pennsylvania, $20.50@21.00; Buffalo, $17.50@18.50; Alabama, $16.50@17.00. Lead—Firm; spot, New York, 6.50c; East St. Louis, 6.35c. Zinc—Steady; East St. Louis, spot and future, 6.35c. Antimony—9.75c. Quicksilver—$123. Tin—Steady; spot, 50.25c; futures, 49.75@49.87c.

Checking the Program With Achievement

Various Problems Confronting a Telephone Company Shown by Situation in Arizona—Recent Occupation by Bell of New Headquarters Building in Phoenix Definite Point in Solving Problems—Planning and Building for the Future

By Roy George

The state of Arizona affords a nice example of all the difficult problems that have ever confronted a telephone company, and the recent erection of modern headquarters in Phoenix marks a definite point in the solution of these problems under the management of H. D. McVay for the Mountain States Telephone & Telegraph Co.



New Telephone Building of Mountain States Telephone & Telegraph Co., in Phoenix Ariz., Which Is Also Headquarters Building for Company's Arizona Activities.

Among the paramount difficulties are those of building and maintaining lines for great distances through mountainous country and a proper programming of future activities so that a thoroughly modern service can be given to the various scattered communities whose growth introduces rapidly changing factors, both in the increase in population and in the increase in saturation.

The problem is entirely different from that of covering an equivalent area in the East, for example, where every mile of line extension opens up a compact community whose demands are not only closely calculable but fairly stable; and it will not be a surprising thing to find that the state of Arizona, with all the promise it affords of a remunerative future, must still be studied in figures that run into startling thousands of dollars all in the red.

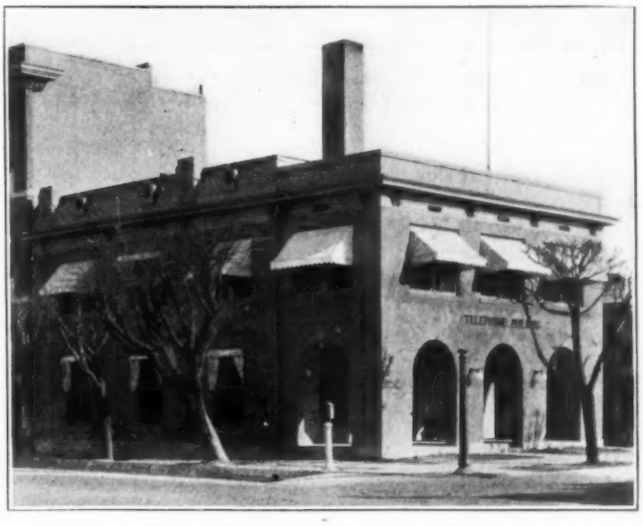
In fact, the problem is to meet the demands of the rapidly-increasing tourist influx, insisting on an absolutely cosmopolitan service, and to do this with an outlay that will eventually pay a fair return on the investment and will prove to be laid on the right foundation for an adequate expansion program.

The city of Phoenix and the rural district of the Salt River Valley afford a fair example of the conditions to be met and the way the management of the Mountain States Telephone & Telegraph Co. is meeting them.

During the week of the state fair, in 1926, the central switchboard recorded a total of 79,000 calls; for same week in 1927 the number of calls rose to 128,000; the average number for 1928 is up to 105,000 a day, every day, seven days a week. During this period of phenomenal growth there has been no traffic jam. It had all been provided for and, of course, it is very welcome business.

But the company had waited 15 years for it to come.

Again, when the Mountain States organization went into Phoenix, two companies were operating there in competition. The service was exactly what it often is under such conditions—chaotic. But the fundamental differences in the two installations made the problem of amalgamating them particularly difficult. Either, both lines should be torn out and the entire service built up on a new foundation; or a gradual



The Phoenix Telephone Building of 1912 and Offices of the Mountain States Telephone & Telegraph Co., Phoenix, Arizona, in 1922.

merger and substitution of apparatus must be effected. Time was to be the determining factor, as it proved, both in economy and efficiency.

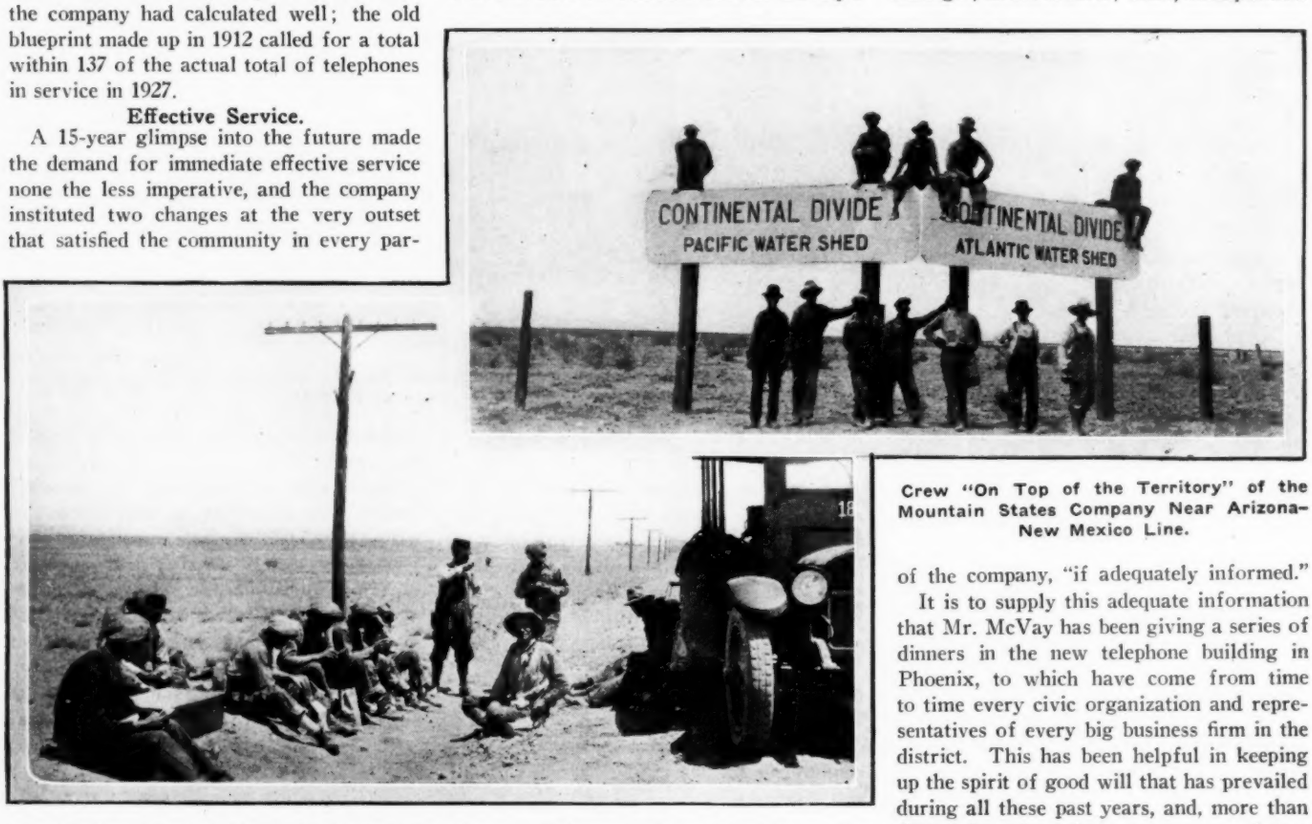
How much time was there to be for the complete reconstruction?

In 1912, Mr. McVay made a population survey to cover the next 15 years, determining the probable saturation point in business and social service covering certain fixed locales of the Salt River Valley. From this survey, it was determined to begin a program of gradual change to a strictly modern installation, capable of state-wide expansion in accordance with the development of the entire territory. Evidently, any miscalculation as to the time at the company's disposal would throw the service into a terrific tangle.

The end of the 15-year period shows that the company had calculated well; the old blueprint made up in 1912 called for a total within 137 of the actual total of telephones in service in 1927.

Effective Service.

A 15-year glimpse into the future made the demand for immediate effective service none the less imperative, and the company instituted two changes at the very outset that satisfied the community in every particular and established that confidence and good will that have marked every step of its progress.



Construction Crew of Mountain States Telephone & Telegraph Co. at Lunch in the Desert Beside the Telephone Lead Upon Which They Have Been Working.

Crew "On Top of the Territory" of the Mountain States Company Near Arizona–New Mexico Line.

The first was the complete re-equipment of the city service with modern machine-switched stations; the second was the institution of a rural service, engineered for the latter installation of machine-switching centrals when the development should warrant it.

With the completion of the Roosevelt Dam, the Salt River Valley became a live rural community with Phoenix as the central city. The telephone service was extended to cover this territory without delay, with no hesitation over costs and with every possible facility for adequate service.

In the later years, as the valley filled up and the population increased, the value of the service to the subscriber has advanced as the saturation rose, and the public has been gradually educated to the fact that such increased value in the service must eventually necessitate an increase in telephone rates. The average man has to be made to stop and think before he realizes that the telephone is the one commodity that increases in cost as it increases in the number of consumers; but, when he does stop to think, if he has had the kind of service that Phoenix enjoys, he is ready to pay more money for the increased service.

The 12,700 telephones in Phoenix afford, under the existing rate schedule, so much free service that it is to be wondered at that this fact has not been used in the city's advertising. Measured by the service in other cities, this service cannot be continued except on the basis of a continuing loss of revenue and a reduction in service efficiency. It is recognized that action must be taken to correct this condition, amounting, as it does, to an abuse of an essential public service.

"Your Number Doesn't Answer."

The wonder is that anyone has any manners left in an age of telephones, so easy is it to swear at anything inanimate; but the politeness of the telephone girl is proverbial and the subscriber becomes less violent and even less critical as he gets acquainted with the workings of the plant; if he loses in emotion, he gains in intelligence.

For instance, the man who has seen how the hook-up is made on a machine-switching system, knows that when a certain load has been reached, the thing has no more power to make a cut-in. Therefore, when he turns his dial thereafter and gets no response of any kind, he is likely to ponder on the fact that school is just out and that some hundreds of youngsters are clamoring to get something said that has been pent up all morning, with the consequence that scores and scores of dials are being whirled like squirrel cages all over town, and that if more service is wanted by the community at this hour, some one has got to pay for it.

"The public is reasonable, honest and fair-minded," says Milton Bernet, publicity manager, at the Denver, Colo., headquarters of the company, "if adequately informed."

It is to supply this adequate information that Mr. McVay has been giving a series of dinners in the new telephone building in Phoenix, to which have come from time to time every civic organization and representatives of every big business firm in the district. This has been helpful in keeping up the spirit of good will that has prevailed during all these past years, and, more than that, it has given the average man a better insight into the working of a modern telephone system.

"We have an obligation to inform the public," says Mr. Bernet, "because the telephone must be partially operated by the public. The customer originates all calls and completes all calls. If the public do not know how to use the telephone, or from inadvertence fail to use it correctly, not only their service but that of other people is harmed."

For years Mr. McVay has made use of the public press and of bulletins put out by the company to educate his public in the proper use of their equipment. At the first, he had to do it on account of the condition of the lines when he took them over; later, he kept it up as being as im-

portant as educating the operators engaged in completing the calls. His organization, now that he has moved into modern quarters, shows up as a model of its kind—and he still includes his public as a part of the organization.

Everything runs through this Phoenix office. Three departments, engineering, traffic, and auditing are included in the personnel of the staff, and the building is constructed to house these separately and engineered to allow for their expansion. It is typical of the entire system, after 15 years of gradual shift and share, during which outworn devices have shared in the growing load until all has been shifted to the complete new equipment.

The auditing department takes care of the business for the entire state of Arizona. In the traffic department are provided facilities for training operators for the local requirements, and for giving such special training as may be demanded by the service throughout the state. The engineering department covers the present activities of the company and forestalls its future development. At present it is engaged in making a survey as a foundation for the next 15 years.

More definitely, the programming is based on a provisional estimate figured on a basis of five years in advance, and labor and material are calculated on an analysis of proposed activities in the district with their probable demands for new service.

Modern warehousing makes it possible to get standard equipment on short notice, but even these must be estimated months in advance if they are to be distributed economically; and frequently switchboards and special equipment require more than a year for their delivery.

The labor requirements involve a human element that the telephone company is always quick to take care of, and these preliminary surveys make it possible to build up an efficient force of telephone men and women well in advance, while at the same time giving them continuous employment.

After everything has been done that figuring can do, there remains a sixth sense—a sort of intuition developed by experience—that enables an executive of the company to feel his way into the future of the business under his control. And if ever there was a place where the exercise of this special faculty was necessary, it was in the Phoenix of 1912, particularly noticeable as it stands out now in retracing the development of the organization during these past 16 years.

To Organize New Company for Communications Service.

The directors of the Radio Corp. of America at their regular meeting on December 7 decided to create a separate communications company to take over all the communiations business of the corporation. General James G. Harbord, president of the Radio Corporation, and David Sarnoff, vice-president and general manager, will be in charge of drawing up plans for the organization of the new company.

The new communications company, it is expected, would greatly facilitate any future negotiations either with the Western Union or Postal Telegraph companies, with a view to selling the Radio corporation's communications business.

The White act makes any such merger or sale impossible at present, but it is felt that future amendment of the act might enable domestic and foreign telegraph communications of the United States to be combined into two competing systems, or even into a single company.

At the time the White act was enacted by Congress the communications of the British Empire were divided into competing cable and wireless companies, but during 1928 steps have been taken to unite all communications into a single system. The House of Commons assented to the consolidation last month, and only the approval of the dominions and colonies remains to make the merger plan effective.

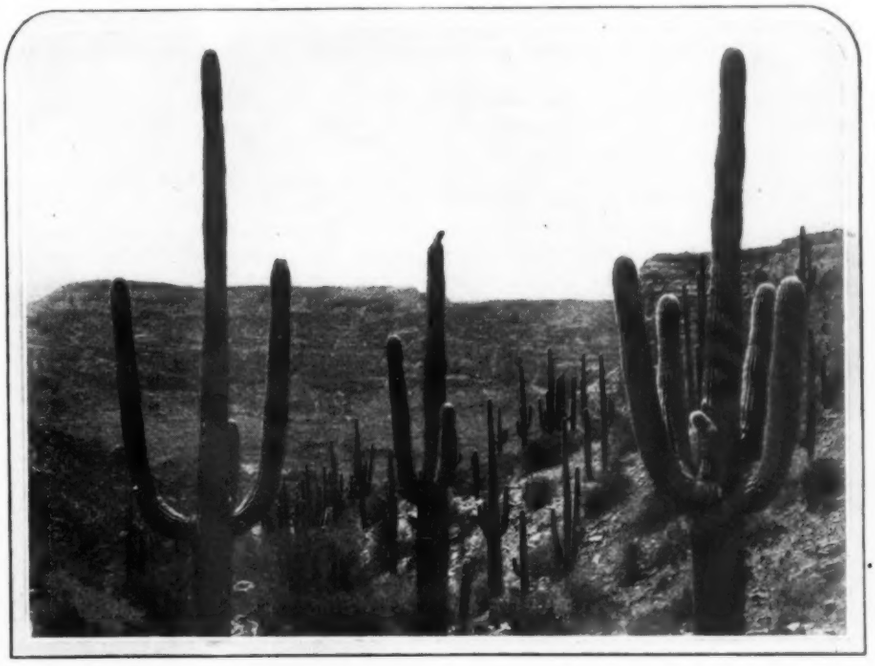
Survey of Chicago Radio Listeners Made by Telephone.

Unquestionably the most interesting and the hardest fought battle any radio broadcasting station has yet made for its rights on the air was staged recently in Washington in a three-cornered fight between WENR of Chicago, owned by the Insull interests; WLS of Chicago, whose ownership was recently reported to have passed from Sears, Roebuck & Co. to The Prairie Farmer, and WCBD of Zion, Ill., with Wilbur Glenn Voliva, general overseer of the Zion, himself on the job.

Revealing one of the most remarkable radio surveys ever made, there was introduced by WENR the results of about 103,000 telephone calls made to ascertain from Chicagoans their favorite radio station.

This work was carried on by an outside concern, employing 35 girls to call the numbers and 20 girls to look up names. To assure themselves that these girls were in no way suggesting stations or "leading" those called, there was a control board for listening-in to supervise the work.

Of those who did answer, it was said 12,541 designated WENR as their first choice of Chicago stations, 10,158 placed KYW first, 8,190 voted for WGN, 6,890 WMAQ, 3,693 WLS, and 3,323 WBBM.



Some Arizona Country With Giant Saguaro on Guard Along the Old Apache Trail.

New Chicago Holding Company Includes Water and Telephone.

Formation of Utilities Public Service Co. to acquire a group of public utility companies in the Middle West valued at $11,750,000 was announced in Chicago on December 10.

The company already has obtained control of Associated Public Utilities Corp. and Standard Public Service Corp. with 171 communities in Ohio, Illinois, Iowa, Missouri, Oklahoma, Texas, New Jersey, West Virginia, Indiana, and California. Services include telephone and water.

The Standard Public Service Corp., which had its headquarters in Wheeling, W. Va., serves 41,000 telephones operated through 145 exchanges.

A new issue of $1,500,000 Standard Public Service Corp. first lien 6 per cent gold bonds series B, due in 1948, was offered this week by the Federal Securities Corp., Central Trust Co., and G. V. Grace & Co., all of Chicago.

Unit Leaks vs. Megohms for Line Testing

An Explanation of the Unit Leak or Natural Method of Expressing Line Insulation and Discussion of Its Advantages Over the Megohm System Formerly Used—Simplified Conversion Formulae Reduced to Arithmetical Rules

By Harry N. Faris,

Telephone Consultant and Technical Engineer, Public Utilities Department, United Trust Co., Abilene, Kans.

Forms for recording toll line insulation according to the unit leak method have been furnished by the larger companies for some time, but such forms have been arranged so that either the new unit leak system or the old megohm system may be used, according to the tester's familiarity or preference. This option has somewhat retarded the adoption of the unit leak system and this article is an effort to present it as the more logical one to use, it being just as easy for the wire chief to figure and much easier for maintenance men to understand.

The former practice of rating line insulation resistance in megohms per mile was perhaps satisfactory to the engineer who could visualize a "clean" line as represented by a high figure and a "brushy" line as represented by a low figure. To the maintenance men, this system has been quite confusing as the real subject is that of toll line *leakage*, and they have not been able to understand why clear lines should be rated with a high figure while brushy lines, with many more leaks per mile, are rated with a low figure.

Their difficulty in this respect shows the absurdity of trying to speak in terms of resistance when we are unconsciously thinking in terms of conductivity. The latter is what really counts, and resistance is only the absence of perfect conductivity. When we rate a toll line for leakage by stating the number of megohms per mile, we are really indicating how much *air* is in contact with the line, whereas the maintenance man would much rather know much *foliage* is in contact.

This leakage condition can readily be expressed since we have a unit of conductivity as well as a unit of resistance. The unit of resistance is the ohm, with which we are all familiar, but we may not be so familiar with the unit of conductivity called the "mho" because conductivity is the opposite of resistance.

A column of mercury of one square centimeter cross section and one meter long, at a certain temperature, has a resistance of one ohm, and it also has conductivity of one mho. A No. 22 gage copper cable conductor, approximately 60 feet long, likewise has a resistance of one ohm and conductivity of one mho. Increase its length to 120 feet and the resistance becomes two ohms and the conductivity drops to ½ mho. Substitute a 60-foot No. 19 gage cable conductor, which has twice the cross section of No. 22 gage, and the resistance drops to ½ ohm while the conductivity doubles and becomes two mhos.

Thus we see that conductivity is always the opposite of resistance or, more accurately, the conductivity figure in mhos is always the reciprocal of the resistance figure in ohms; the "reciprocal" of any number being one divided by that number.

In This Article Mr. Faris Presents the Unit Leak System as the More Logical to Use for Recording Toll Line Insulation, It Being Easier Than the Old Megohm System for Maintenance Men to Understand.

By this method, leakage on a toll line can be expressed in mhos as well as in ohms but since a one mho leak, represented by a No. 22 gage cable conductor 60 feet long, would be a "dead ground," it becomes necessary to select a less severe "unit leak" known as the "milli-micro-mho" which, as the name indicates, is one-billionth part of a one mho leak. This may be visualized as the leakage or grounding effect of a "wet spider web" of one billion ohms resistance between a line wire and a lightning ground wire.

With such a unit leak it becomes possible to rate lines for leakage according to the average number of such "unit leaks" per mile. Also since the old unit of insulation was in megohms, which means millions of ohms, it follows that the number of unit leaks per mile will be the number of megohms per mile divided into 1,000 and, reciprocally, the number of megohms per mile is the number of unit leaks per mile divided into 1,000.

Thus the old minimum requirement of ten megohms of insulation per wire mile permits of 100 unit leaks per mile as the maximum allowable leakage on toll circuits. Also lines that have an insulation resistance of 25 megohms per mile have been reduced to 40 unit leaks per mile, and the still cleaner lines with 40 megohms per mile are cleared down to 25 unit leaks. It is to be noted that the former 25 megohms equal 40 unit leaks, and the former 40 megohms equal 25 unit leaks and that 32 megohms equal 32 unit leaks. At approximately 32 megohms per mile, the megohm and unit leak figures are the same.

Thus companies which have heretofore required that megohms of insulation be kept up to 32 per mile may now require that the unit leaks be kept down to 32 per mile. This is due to the fact that 32 is practically the square root of 1,000 and on each side of this figure all megohm and unit leak figures whose product is 1,000, like 25 and 40, simply change places. Believing the billion ohm "wet spider web" will enable anyone to visualize the new "unit leak," it now remains to describe how toll lines may be measured and rated in unit leaks per mile by means of ordinary voltmeter testing equipment.

This problem is simply that of converting voltmeter deflections into ohms, the simplest formula for which is:

$$X = \frac{ER}{d} - R.$$

In this

X = Unknown resistance sought;

E = EMF or voltage of testing battery, expressed either in volts or scale divisions, but with deflection d expressed in the same units;

d = Deflection through resistance X, and

R = Resistance of the voltmeter, including any multiplier resistance which may be connected externally to permit the use of high testing voltage.

It will be noted that in this formula, ER is constant for any given voltmeter and testing battery and is the total circuit resistance, including the voltmeter, for a deflection of one scale unit. $\frac{ER}{d}$ is likewise the total resistance for any deflection, d, and it only remains to subtract the volt-

meter resistance, R, to secure the external resistance, X.

Applying the formula to insulation measurements converts the voltmeter deflection into ohms of insulation resistance for the entire line. We must next *multiply* this figure by L, the number of miles under test, since the insulation resistance for one mile of wire would be 50 times as high as for 50 miles under test.

Thus the formula for ohms per mile becomes:

$$X = \left(\frac{ER}{d} - R\right)L.$$

Since the resulting figure in ohms is high, it is reduced to megohms by pointing off six places from the right.

As already stated, megohms per mile may be converted into unit leaks per mile by simply dividing the megohms per mile into 1,000, or the ohms per mile into 1,000,000,000, so that unit leaks per mile may be determined directly from the voltmeter deflection by the single formula:

$$\text{Unit leaks per mile} = \frac{1{,}000}{\text{megohms per mi.}},$$

$$\text{or} = \frac{1{,}000{,}000{,}000}{\left(\frac{ER}{d} - R\right)L}.$$

Expressing the megohm formula as an arithmetical rule, we would say: Multiply voltage of testing battery by internal resistance of voltmeter. Divide product by average deflection, d. Subtract the internal resistance of the voltmeter. Multiply remainder by miles of wire. Result is the insulation resistance per mile *in ohms*. For megohms point off six places from right. To reduce to number of *unit leaks* per mile, divide the megohms per mile into 1,000 or the ohms per mile into 1,000,000,000.

Expressing the direct leakage formula as an arithmetical rule we would say: Multiply voltage of testing battery by internal resistance of voltmeter. Divide product by average deflection d, subtract internal resistance of voltmeter, multiply remainder by miles of wire. The result is the insulation resistance per mile in ohms. Divide this into 1,000,000,000 (or point off six places from right and divide into 1,000) and result is unit leaks per mile.

If the testing voltmeter be already calibrated in ohms, for standard testing battery, leakage measurement of the entire line may be directly determined by dividing the ohms into 1,000,000,000 (or by reference to a table of reciprocals), after which the total leaks must be *divided by* the wire mileage to determine the number of unit leaks per mile.

It would, of course, be possible to calibrate the voltmeter to read total leaks directly, in which case zero would appear at the left side of the scale to represent a clear or open circuit condition while ∞, representing infinity, would appear at the extreme right to represent a short circuit or "dead ground." Special testing meters with unit leak calibrations may appear in the near future, but it will always be necessary to divide the total leaks by the wire mileage to arrive at comparative figures.

The standard voltmeter for insulation testing on telephone lines and cables has an internal resistance of 100,000 ohms and employs 150 volts of testing battery. The 150 volts is necessary to indicate true conditions on toll lines or in cables, but the high internal resistance is not essential and even the standard 10,000-ohm 30-volt meter so commonly used in smaller offices may be used with 150 volts of radio "B" battery by connecting a total of 40,000 ohms of multiplying resistance, in series with the testing battery. This raises the meter to 50,000 ohms and if it is calibrated for direct reading of ohms with a 30-volt battery, the readings with 150 volts will simply be five times as great.

Even 30-volt 2,000-ohm portable pocket meters may be used with 150 volts by connecting in 8,000 ohms of multiplier resistance, which is especially suited to rough routine cable tests since the passage of a possible maximum of 15 milliamperes of current will burn light carbon smut clear and permit the meter to indicate only such cable moisture as may be present. Such a meter is also satisfactory for testing long toll lines or entire groups for insulation resistance, but is not sufficiently sensitive to test short toll lines, or the separate conductors of a phantom group, since the deflection secured is insufficient for accurate calculations.

In all insulation tests it is highly essential to use a reversing key and test alternately with each battery potential to ground, and take the average of the two deflections secured. While this was originally done to neutralize differences in ground potential, it is now recognized that the widely-varying deflections are due rather to the rectifying or "crystal detector" action of ground contacts with oxidized copper line wire so that current is passed much more readily in one direction than in the other. On this theory it would have been more proper to take the maximum deflection, but since the average deflection practice has become standard it must be retained for comparative purposes.

If toll test men will use the simplified formulae or arithmetical rules herein given in place of the more complicated "drop of potential" formulae usually given, small offices as well as large ones will be able to express toll line insulation according to the natural system of unit leaks which will help to hasten the longed for day when not only uniform methods but a *universal language* may be used by telephone technicians throughout the English-speakng countries of the world.

Telephones in the Territory of Southwestern Bell Company.

In the past 25 years the telephones in the Southwestern Bell Telephone Co.'s territory have increased more than 1,800 per cent. The Southwestern Bell operates in the states of Missouri, Kansas, Arkansas, Oklahoma and Texas and in a small portion of Illinois adjacent to St. Louis. This is a region covering one-fifth of the total area of the United States.

During 1927, 60,141 new telephones were connected to the Bell system in this territory, so that at the beginning of the present year there were operated 1,236,634 Bell-owned telephones and 837,779 Bell-connecting stations, making a total number of 2,074,413 telephones served in this section by the Bell.

An average of 8,622,919 exchange messages daily was carried over the Bell lines in these states during 1927, an increase of approximately 1,000,000 messages a day over the figures for 1926. During the same year the number of outward toll messages from the territory increased from 53,223,265 to 57,116,404. To handle this telephone business a total of 27,344 employes is required of which 18,332 are women.

The wire mileage in these states, including exchange and toll, figures up to 4,881,256 miles, to which might be added a little more than 100,000 miles of connecting company toll wire.

Twenty years ago there were only about 250,000 Bell-owned or Bell-controlled telephones in the territory of the Southwestern Bell. It was not until 1914 that this number reached 500,000, while the million mark was not attained until 1923. In the four years since then, about 300,000 Bell telephones have been added, which is as many as the total number in the territory in 1909.

The number of connecting telephones has likewise shown a steady increase so that the total number of instruments in these states will probably be approximately 2,200,000 by the end of the present year.

Operation of Telephone System in Rio de Janerio, Brazil.

The municipal council of Rio de Janeiro, Brazil, has approved a bill authorizing the mayor to invite bids for the operation of the city's telephone system, thereby canceling the present contract with the Companhia Telephonica Brasileira, which is a subsidiary of the Rio de Janerio Tramway, Light & Power Co., a Canadian concern.

The successful bidder will be required to complete the installation of automatic telephones within two years. The date for the reception of the bids has not yet been set, but it probably will be some time next year.

Maintaining Good Health of Operators

Health Supervisor Tells of Work—Results to Operators of British Columbia Telephone Co., British Columbia, Which Leads Provinces of Canada in Telephone Development, Having 18.7 Telephones Per One Hundred Population

By Miss K. Perrin, R. N.

Health Supervisor, British Columbia Telephone Co., Vancouver, British Columbia, Can.

In attempting to outline my work with the British Columbia Telephone Co. in the capacity of health supervisor, I am impressed with the knowledge that without the splendid cooperatjon, lively interest and the ready sympathy and understanding of the company's officials which my work has ever received, nothing, or at best a very little, could have been accomplished.

Due to the fact that telephone work is attended by no more hazards than one would expect to encounter in any large business office, there is small need for first aid service. The occasional foreign body to be removed from an eye; cuts, wounds or abrasions occurring outside of the office to be redressed; a sore throat to be painted—this about constitutes the sum total of the actual practical nursing.

Home visiting of the sick has always been, and still is, done by the employes' advisor so that in the appointing of a graduate nurse as health supervisor the company had in mind not so much the care of the sick as the prevention of sickness by the spreading of the gospel of positive health among its employes.

Working conditions of the operating staff, which comprises 1,533 employes, are both pleasant and hygienic. The operating rooms are spacious and well ventilated; the working day of seven hours only is broken by means of 15-minute relief periods into shifts rarely reaching and never exceeding three hours.

There are large, airy and attractively appointed restrooms where the girls congregate during lunch hour and rest periods to sew, read, play the piano or listen to the gramophone, and where the newest dance steps are demonstrated and the latest fashion in dress displayed. There is also, in each of the larger offices, a "silence room" provided with couches, cushions and rugs where those so inclined may rest, undisturbed.

Many of the girls board, batch or live so far distant from the office that they are unable to go home for their lunch. To facilitate their procuring hot, light and nourishing meals at a very nominal charge, there have been installed in each of the larger exchanges, up-to-date cafeterias. These are operated without any idea of even making them self-supporting as the company carries one-third of the cost of provisions and is quite satisfied if the cafeteria can clear the remaining two-thirds. In this way very substantial meals may be had for such smali sums as 15 and 20 cents.

This department offers splendid opportunities in the line of the promotion of good health. In arranging the daily menus, which I make as varied and attractive as possible, the use of the protective foods is encouraged by supplying salads, tomatoes, lettuce, fresh vegetables and dairy products at the lowest possible price throughout the entire year.

Miss Perrin Tells in an Interesting Manner of the Good Results Obtained From Her Work as Health Supervisor of the British Columbia Telephone Co.

The consumption of salads in our largest cafeteria has jumped from six or nine daily to 40, 60 or 90 per day. Meats and pastries have to a great extent given place to sandwiches, salads, creamed vegetables and fish, bran muffins and milk. From records kept over a period of two months following the display of posters advocating the drinking of milk, and after making a reduction of one cent in the cost of a glass, we found that the consumption of milk as a beverage increased 60 per cent.

We feel, and rightly enough, proud of the type of girl employed by the company. Ranging in age from 17 to 25 years they, for the most part, have come direct from high school where they have spent two, three and in some cases four years. Some leaving school earlier have been employed elsewhere. Here I might say that it is most unusual for a girl to resign for any reason other than to assume the responsibilities of married life. Married women are employed only as temporary or all night operators. When a girl marries she resigns.

The applicants, following their acceptance by the employment chief, undergo a medical examination by the company's doctor, after which they receive a month's tuition before being taken on the staff. It is as students that I give them a health talk along the lines of hygienic living, laying particular stress upon the importance of daily exercise and correct posture in the maintaining of health.

Upon interviewing older employes I find that the ailments most common to them are those arising from insufficient exercise, and the accompaning history is almost invariably one of having either immediately or gradually given up all physical activities upon taking up telephone work. I endeavor to impress upon them the fact that the retaining of the good health with which they have been endowed lies almost entirely with themselves, demanding only an intelligent knowledge of the requirements of the body plus the desire for good health and the will power to systematically do those simple things which insure the very best of working conditions for the various organs of the body. I further emphasize the importance of health in the creating of beauty, efficiency and advancement in their work.

During her first month of employment each girl reports at my office. This interview I make as informal in nature as possible, learning from the individual much concerning her family history, previous illnesses, mode of living and attitude toward her work. A record is made of this, together with her height, weight, chest expansion, posture, and condition of throat and teeth. Symptoms of eye strain or nervousness are particularly noted. By means of a card under file these records are available for future reference.

Again, at the completion of 11 and 22 months' service the girls return to me, when I compare their present condition with their past record. We are thus enabled to keep a close check upon those whom we consider as requiring special attention; and in many cases we have had them see their own physician, thus preventing more serious developments with a greater loss of time.

Again, girls are sent to me by their immediate superiors for the following reasons: (a). Irregularity of attendance giving "ill health" as an excuse; (b). Lack of progress or interest in work with "ill health" as the given cause; (c). Changes in appearance likely to have arisen from either "ill health or unhygienic habits of living."

Through the medium of a monthly magazine published by the company for the benefit of the employes, I am able to reach those with whom I otherwise might never come in contact. I write a health article for each issue, emphasizing to the best of my ability the doctrine of prevention rather than cure. I point out the value of periodical medical examinations, the danger of patent medicines, or any self-administered drugs, the value of a healthy, happy and fully occupied mind in the building of a healthy body.

During the past year the company has, upon my recommendation, arranged that, in addition to the regular annual vacation of two weeks given all employes showing a year's service, operators taken on from January to April inclusive are given one week, following six months' service; and those taken on the staff in October, November or December are allowed nine days during the regular vacation period of the following year.

In this way no operator works for longer than one year without vacation. From my interviews with the operators I find that in almost every instance the first few months are the most trying, and I find that the company's consideration in giving them this time is not taken as a matter of course but is really appreciated.

Two years of positive health teaching affords too short a time for one to look for any great results shown in the decrease of illness, but as time goes by, if my teachings are to bear any fruit, we should notice some sort of reduction in our list of absentees due to illness, and the absences should on the whole be of shorter duration.

The fact that employes are sufficiently interested in the maintaining of good health to come voluntarily to be weighed and reweighed if underweight, to seek advice in the prevention or cure of colds, and for help in the formation of more hygienic habits of living, is in itself encouraging. The idea of there being a graduate nurse to look after their health is, on the whole, appreciated by the employes and to a still greater degree by their parents.

A THOUGHT FOR TRAVELING CHIEF OPERATORS

By Miss Anne Barnes

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

The minds of our students are like gardens, and we may be likened to gardeners. When we are assigned an office, we put our instruction books into our brief cases and start for that office, with high hopes that we are going to plant constructive thoughts in the minds of our students, which will grow and guide them in their work.

A gardener must have the proper equipment to work with, know how to do his work so that he will not waste material and time; and it seems to me that he must love his work if his garden is to grow and bear fruit. And so must we.

A gardener has weeds to uproot. So have we. He gets the soil ready before he does his planting, but we cannot do that. We plant our new ideas right into the midst of that which must be weeded out later. And sometimes we have to make several return trips to an office before the old has been discarded and the real growth of our efforts is noticeable.

It takes concentrated effort to succeed. Sometimes we fail, and we do not understand why, especially when we have spent a great deal of time in our office. I wonder if this may not be a contributing cause for our slow progress:

If we simply memorize our methods, phrases, and office routines without giving much thought or reasoning as to their purpose, we cannot hope to plant constructive and fruit-bearing thoughts in the minds of our students. We will, instead, be planting only words assembled into sentences. Dead sentences cannot bear fruitful thoughts.

If we would succeed in our work, we must know not only our methods, phrases, and office routines, but we must quicken them into life through thoughtful reasoning when planting their meaning in the minds of our students. Then we can go away feeling confident that our students will think our thoughts are worth cultivating. And we can hope for a good thought harvest in that office.

Mary Jones, Mary Jones,
How does your garden grow?
Methods and phrases,
Methods and phrases,
Planted deep all in a row?

Mary Jones, Mary Jones,
Did you plant in a shallow row,
Just methods and phrases,
Methods and phrases?
Then how could you expect them to grow?

Mary Jones, Mary Jones,
Did you thoughtfully plant in a row,
Your methods and phrases,
Methods and phrases?
If so, they will surely grow.

Class A Stock Issued by Standard Public Service Co.

Forty thousand shares of class A participating stock were recently put out by the Standard Public Service Co. Packer, Cooke & Co. and G. V. Grace & Co., Inc., marketed the issue. J. E. Albert is vice-president of the Standard Public Service Co.

The Standard company will, it is stated, upon completion of present financing, control through its subsidiaries a system of telephone properties serving without competition a total population estimated in excess of 200,000 in the states of Illinois, Indiana, Iowa, Missouri, Ohio, Oklahoma and Texas. This system operates 77 exchanges with over 24,000 stations or connections.

In addition, through subsidiaries, the company will furnish water for domestic and industrial purposes in 19 growing communities in New Jersey, West Virginia, Ohio, Indiana, Oklahoma and California, the total combined population of which is approximately 120,000.

Gross earnings of the company for the 12 months ended July 31, 1928, were $1,322,400.23; operating expenses, maintenance, local taxes, etc., were $679,848.03; consolidated net earnings, $642,552.20; total prior interest and dividend requirements, $384,325, leaving a balance of $258,227. Annual preferred dividend requirements are $70,000.

Sundry Snapshots Along the Trail

Observations Pertinent and Otherwise on the Sunshine and Shadows of Telephone Work

By Well Clay

When mother used to roll her sleeves
  And neatly tuck them in,
Then take a "sifter" full of flour
  From the good old flour bin
To sprinkle on the "mixing board"
  A foundation snowy white,
I knew there'd be good things in store
  When I got home at night.

P'rhaps 'twould be a "batch" of bread,
  Or cookies nice and brown,
Some snowy biscuits, crisp doughnuts,
  Or fat pies crimped around,
Some ginger cake all nice and hot;
  Then what a feast there'd be,
For mother never failed to save
  A good big **hunk for me.**

Some things in life seem to cling to our memories without dimming for many a passing year, while others are gone before we know it and are lost in that realm of things that were, forever. That is one reason why a lineman can remember distinctly for years the size and weight of the big fish he caught one bright autumn day and recall all the things that led up to and happened during the big event, but finds great difficulty in remembering how many insulators he used on the last installation job, or where he left the missing tools.

That is why we must turn ourselves into statistic hunters and history gatherers, so we can more clearly set out the guide boards along the way of progress for the benefit of those who desire to follow the safer and better way to continued prosperity.

In a recent issue of TELEPHONY I submitted a few statistics setting forth the results of a peg count of 15 days during the month of May of this year. The number of calls ran to something like 78,000 calls in the 15 days, not including toll calls. Not a record breaker, as I said, but still enough to take notice of and to use as a basis of comparison. Reducing these calls to a question of unit costs, we find that each one did cost something. But how to find out what?

Suppose we take, to get at it in one way, the entire operating cost of the plant for the period during which the peg count was taken and divide by the number of messages handled. We can get at that in two ways: one to take the details of all the costs one by one and add them together, such as operators' salaries, manager's salary, wire chief's and linemen's salary, light, heat, insurance, automobile expense and all; or we can take the total operating expense for the year up to that time and divide it into 15-day periods and take the amount for one of these.

In our case, the latter method showed the total expense to May 15 from January 1 was approximately $9,900. This sum included interest, taxes, depreciation, insurance, light, rent, heat, labor and materials used on repairs and replacements. A 15-day period would take one-ninth of this sum or $1,100. This sum divided into 78,000 units tells us that each one of these calls cost, to put through, 1.4 cents each.

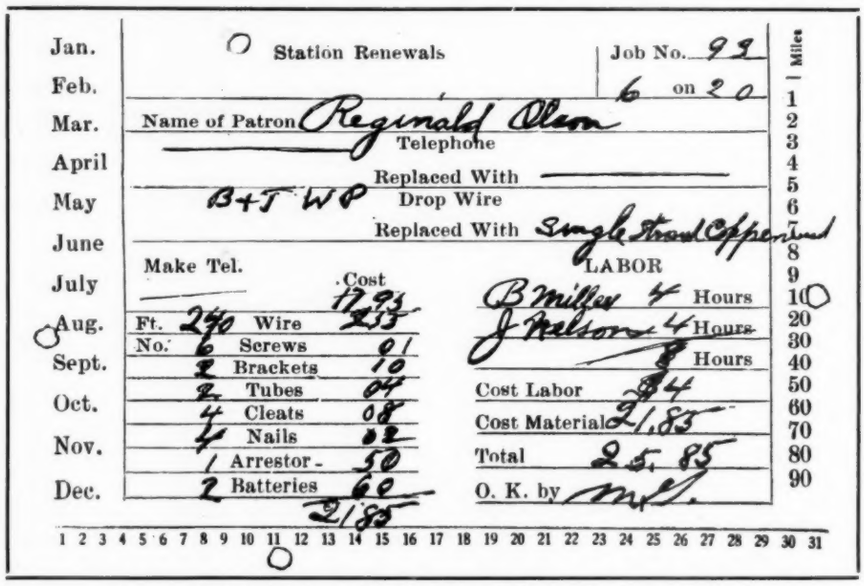
Thus a steady stream of money is flowing night and day out of our revenues, regardless of what comes in. Wise forethought and careful management are needed to keep this stream from growing too large and the incoming stream too small. Whether we believe in the straight-line theory, or other methods of depreciation, matters not. We must keep the two streams at a relatively proper size to insure safety, permanence and profit.

The matter of reducing all activities of telephone operation to a unit cost basis and finding out just what that is, perhaps never will be completely accomplished; and if it were, the price would be different each week or month and year. However, it is well to know as near as possible.

One of the greatest of drawbacks in the finding of unit costs is the reluctance of the ordinary telephone employe to recording the details of his activities with sufficient accuracy to make a truthful tale—not that they are dishonest, far from it. They just do not see the necessity for so much red tape, as they express the matter, and fall back on generalities, or forget to report many items entirely.

Your ordinary lineman does not have the patience or inclination, even if he has the faculty of memory, to write down so many things which seem to him highly non-essential and of little value. In other words, he is on the wrong side of the magnifying glass; he cannot be both the force and the analytic.

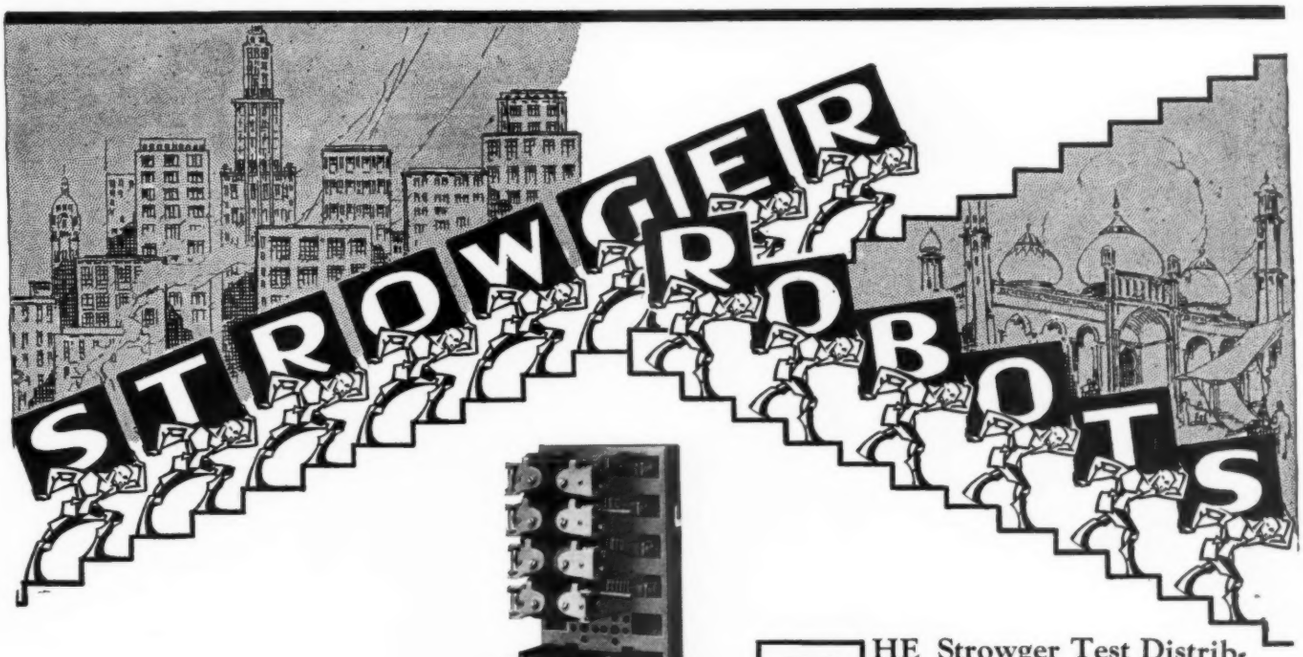
It will be necessary, perhaps, in our search for truth, to reduce the producing of records to a method which will be more nearly automatic and have it done in a way which will leave but little for the workman to wrestle with. Any lineman would sooner use a punch than a pencil any day, and the matter of punching holes in printed cards rather appeals to him as fun than otherwise. He feels like a conductor on a train, punching the tickets of the passengers.



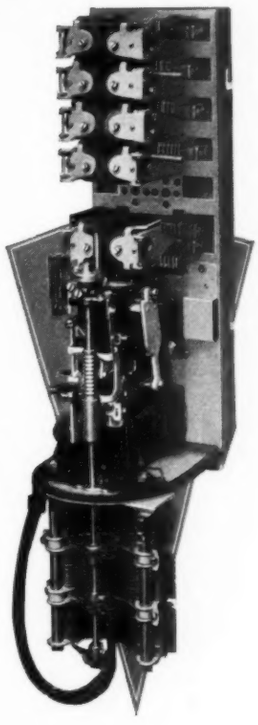
Labor and Material Card Showing Punch Holes Made by Workman.

If the various cards for the different departments, so far as cards are applicable and useful, are so arranged that when properly made out they not only balance in themselves but tie up to and balance as units of a whole, they will help us to attain the important end.

The card reproduced on this page is one which takes care of station renewals and installations. In common with other cards of different departments, it has on one end, ready to the punch, the months of the year; on the bottom, the days of the month; and on the other end, the number of miles traveled. All the cards have this in common and can be filed away by months, alphabetically, or under the heading punched at the top.



The Test Distributor



THE Strowger Test Distributor comprises a standard Strowger mechanism and controlling relays, and affords testing offices a ready means of access to any subscriber's line via a final test selector.

The test distributor enables the testing officer to check the operation of any subscriber's line equipment and to carry out a wide range of tests thereon without undue interference with the service.

Automatic Telephone Manufacturing Company, Ltd.
Strowger Works, Milton Road, Liverpool, England
ASSOCIATED COMPANY
International Automatic Telephone Company, Ltd., London, England

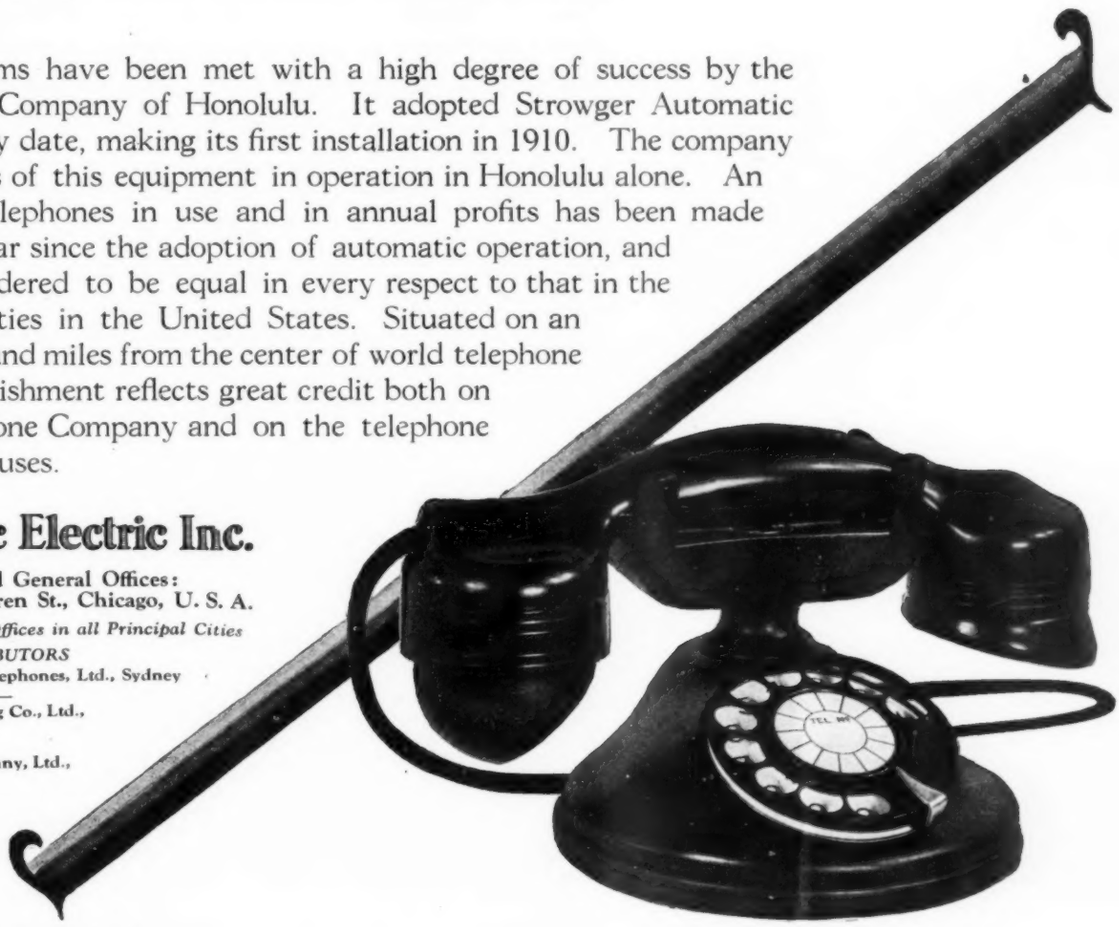
The beautiful telephone building of the Mutual Telephone Company of Honolulu, Hawaii. This company owns and operates more than 20,000 telephones throughout the island group, of which approximately 65% are automatic.

When writing to Automatic Electric Inc., please mention TELEPHONY.

Strowger Automatic Meets Severe Conditions in Honolulu

The Island of Hawaii has presented a considerable number of difficulties in the proper development and operation of telephone service. The relative humidity is high, making rust prevention an important problem. The prevalent salt in the air aggravates the difficulties of insulation in all electrical circuits. The white ant and other tropical boring insects are a constant menace to pole boxes and other wooden parts. Added to these obstacles, is the fact that over thirty per cent of the telephone subscribers belong to the oriental races, making the language problem of prime consideration if proper service is to be rendered.

All these problems have been met with a high degree of success by the Mutual Telephone Company of Honolulu. It adopted Strowger Automatic operation at an early date, making its first installation in 1910. The company now operates 8300 lines of this equipment in operation in Honolulu alone. An increase both in telephones in use and in annual profits has been made practically every year since the adoption of automatic operation, and the system is considered to be equal in every respect to that in the most progressive cities in the United States. Situated on an island several thousand miles from the center of world telephone affairs, this accomplishment reflects great credit both on the Mutual Telephone Company and on the telephone equipment which it uses.



Automatic Electric Inc.

Factory and General Offices:
1033 W. Van Buren St., Chicago, U. S. A.

Branch and Service Offices in all Principal Cities

EXPORT DISTRIBUTORS

For Australia—Automatic Telephones, Ltd., Sydney

For Canada—
Independent Electric & Engineering Co., Ltd.,
Vancouver

Elsewhere—
The Automatic Electric Company, Ltd.,
Chicago

STROWGER AUTOMATIC TELEPHONE EQUIPMENT

At the top of each card is printed the department name, under which it is to be used, with subdivisions of it. The handy punch can reach all of these columns and lines, and a hole punched indicates as much as a whole written line, sometimes.

On the interior of this card, which is largely self-explanatory, are printed the names of the different kinds of material used with a blank space fore and after to use for number and costs of each. When filled out properly and added up, the result shows the cost. This, in turn added to the labor and vehicle costs in the right-hand spaces gives the history of the piece of work recorded very plainly and requires but a minimum of "writing in."

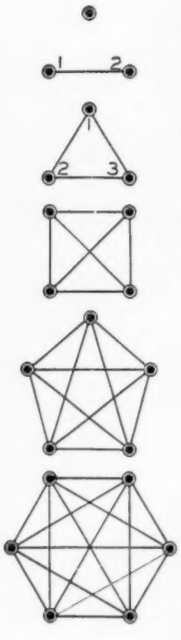
This record may also be used as a check against the hours of labor performed in a day, by one or more men, when several jobs are worked on, by adding together the several cards representing the various classes or pieces of work. These cards, with different inside forms for different departments, can be filed under separate headings in bunches, and their totals will show how much has been spent in each department.

The old method of no accounting, or even that with accounting required only under the head of rural, city, or inside labor, with no detail, left large loop holes, some of them big enough to let through a half-day's hunting, fishing or other sport, with no one the wiser in the auditor's office. It seems to me that if we could, as Independent telephone people, evolve a standard system of history gathering, we would soon get a basis for finding out nearly the true unit costs.

The requirements of some of the departments might include even a space to be left blank for the bookkeeper to carry forward the totals from one card to another and thus show on the last card filed, the amount that department had cost up to date. Every postoffice uses the same kind of blanks. Why not every Independent telephone company as well, with only simple variations to suit different geographical locations?

APHORISM: The best way is not always the beaten path.

433,108,225,278



AT THE LEFT one telephone is represented. One telephone has no service value. There must be at least 2 telephones before service can begin. No possible conversations here.

Here we have a very small exchange with 2 telephones. Service has begun. With 2 telephones, 1 conversation is possible, No. 1 talks to No. 2.

Our exchange is growing! It has 3 telephones. No. 1 can talk to No. 2, No. 1 can talk to No. 3 and No. 2 can talk to No. 3. That's all. Three telephones, 3 conversations.

Still growing! Four telephones now. Somebody's selling. With 4 telephones 6 conversations are possible.

Growing like a weed! Prospect slip sold No. 5! Five telephones, 10 conversations.

Business is GOOD. Another prospect slip added No. 6. Six telephones, 15 conversations.

St. Anne, in the Danville District, has 186 telephones, but if each telephone talks to each other one, 17,205 calls will be made. Glencoe, in the Evanston District, has 2,332 telephones and 2,717,946 separate conversations are possible. Gary, in the Hammond District, has 12,293 telephones and 75,552,778 calls will be made if every telephone talks to every other one, and in Peoria, the largest of the State Area exchanges, there are 24,413 stations and 297,985,078 calls must be made if each station talks to every other one.

Exchange	Number of Telephones	Number of possible conversations if each station talks to every other one
St. Anne	186	17,205
Glencoe	2,332	2,717,946
Gary	12,293	75,552,778
Peoria	24,413	297,985,078

This table shows how rapidly the possibilities for talking grow in an exchange as telephones are added. The more possibilities which exist the more useful the service is. To make the service more useful, more comfortable and more convenient, all of us are selling.

To find out how many different calls may be made over the telephones in *your* exchange, multiply one less than the number of telephones by half the number of telephones. St. Anne has 186—one less is 185. 185 times one-half of 186 or 93=17,205.

The figures at the top of the page show the possibilities in Chicago. Those of us who like figuring may figure out how many telephones Chicago has and send your answers to the Editor, showing how you solved the problem.

An Interesting Presentation of the Possibilities for Talking as Telephones Are Added to an Exchange, Given in New Sales Magazine of Commercial Department, State Area, Illinois Bell Telephone Co.

Possibilities for Conversations as Telephones Are Added.

The first issue of a new monthly sales magazine which is being published for the employes of the commercial department, state area, Illinois Bell Telephone Co., appeared last month. This newest telephone family magazine, which is as yet unnamed, is devoted to the sale of telephone service in the state area of the Illinois Bell Telephone Co.

On the back cover of the magazine appear some sketches and reading matter illustrating how conversations multiply with the number of telephones connected to an exchange. The diagrams and reading matter are reproduced on this page and form an interesting study in showing how rapidly the possibilities for talking grow as telephones are added in an exchange district.

In order to get an idea of how closely an article is read and statements accepted, several errors were permitted by the editor of the new magazine in the reading matter. These undoubtedly will be discovered by TELEPHONY'S readers who sharpen their pencils and do some figuring on the matter which is reproduced on this page.

Western Electric Issues Stock to Finance Construction.

The directors of the Western Electric Co., Inc., have authorized the issuance of 250,000 shares of no-par common stock to be offered to stockholders as of record of December 1, 1928, in the ratio of one share of new stock for each 15 shares held, at $40 a share, payable on or before December 31, 1928.

The American Telephone & Telegraph Co. owns all but a very small fraction of the stock of the Western Electric Co. and will acquire the additional stock in accordanace with its policy of financing part of its subsidiaries' expenditures for construction in return for stock.

Edgar S. Bloom, president of the Western Electric Co., said that with the issuance of the new stock there would be outstanding 4,000,000 shares of no-par common stock, and that the $10,000,000 which will be used to provide additional manufacturing capacity at the Hawthorne Works, Chicago, and at the Kearney Works, between Jersey City and Newark, N. J., and partly to defray the cost of the new plant to be erected during 1929 at Point Breeze, Baltimore, Md.

Here and There in Telephone Work

Revenue Development Campaign of Lincoln, Neb., Company.

The Lincoln Telephone & Telegraph Co., Lincoln, Neb., from October 8 to 13 carried out a well-planned and most successful revenue development campaign that engrossed the energies of a large number of its officers and employes.

Four main objectives were set: To increase the revenue produced from every medium of revenue production known to the company; to place in service all idle plant equipment; to more thoroughly saturate the territory with every kind of telephone equipment, and at the same time to give the public full information about all types of such equipment and services.

The methods followed will interest other telephone companies because all are interested in added revenues. The campaign covered but one week because it was thought best to take as little time as necessary from other matters to conduct the campaign. This necessitated thorough preparation so that when the starting gun was discharged, everybody could make his or her start.

The exchanges were divided into nine groups, the largest exchanges in the first one, the next three in group No. 2, the next five in No. 3, and so on down the line. Each was given its quota of sales units, with a stipulated unit value, a statement of the monthly revenue to be produced and the number of points thereby won. In arriving at a unit of sales for each exchange it was decided to fix 2 per cent of the total stations as of October 1.

In order to arrive at a fair average rental value per exchange of each contract sold, the total rental revenue of the exchange was divided by a number representing the number of stations. This average rental value was taken as the basis of the average value of each sale made during the campaign, regardless of the item sold or the rental value per month of the item, the average figure applying in each case. By this means each exchange, regardless of size, was placed on the same basis of sales units and sales credits in points.

The company cooperated also to the extent of using special newspaper advertisements during the campaign to get the interest of the public aroused and to support the sales efforts of the employes. Forms for reports on daily progress were provided each exchange manager to cover the progress of events in his exchange, and also for the district to the headquarters office in each district every manager made a report every morning after the start. These were in turn sent to the general office, which prepared daily and telephoned to the district office before noon a complete record of sales and points credited to each exchange.

A prize was offered to the exchange in each group compiling the highest number of points. The prize, in turn, was given by the exchange to the employe in that exchange, regardless of department, on the basis of points credited. No record was kept of the number of contacts made, the main idea being that the sales results would speak for themselves.

A prize was also given to the district credited with the highest number of points under the plan. This prize is to be kept in the district office to be used during coming campaigns, it being ruled that before a district may retain it, the prize must be won three successive times.

Organization meetings were held previous to the campaign start, so that every employe knew thoroughly the plans and the objects sought. This was very effective, several exchanges reporting their full quota for the week before the first day had ended, and others following suit on the second and third days. This did not mean any halt in their activities, but merely encouraged them to greater effort. The sales of equipment covered the entire range, but many sales were made of the cradle or monophone type of receiver.

The commercial department headed up the campaign, as getting revenue is its chief business, but the entire personnel was sold on the idea that while the commercial end is responsible for revenue production, the best results can be obtained only when all department employes find by experience that they can sell equipment and services as well as the employes of the commercial department. This idea, once sold, carries its benefits for all time to come while the employes are in the company employ.

The commercial department and superintendents of the Lincoln company with W. E. Bell, commercial superintendent, as host, entertained the winners on Thursday, October 22, in Lincoln.

In the afternoon the winners, who were given the trip to Lincoln, were shown about the Capital City. A 7 o'clock banquet at the Hotel Cornhusker was served and at this time certificates of merit and lifetime pen and pencil sets were awarded as prizes. Following the banquet the party went to the Lincoln Theater.

The winners appearing in the group photograph on this page, left to right, standing, are: Paul Hedrick, Syracuse, winner in group No. 6, who made 30 out of 54 total sales at Syracuse; George Jones, Hebron manager, winner in group No. 5, who made 43 out of 59 total sales; John Spady, Hastings, whose 72 sales at Hastings made him winner in group No. 4; Mrs. Maude Davis, Filley, winner in group No. 9, who made nine sales in that small exchange; and Lillian Harper, Adams, winner in group No. 7, whose 51 sales were 93 per cent of the total made at Adams.

Group of Employes of Lincoln Telephone & Telegraph Co., Lincoln, Neb., Who Were Winners in Recent Revenue Development Campaign.

Those seated are Kathryn Culley, group No. 4 winner, who made 31 sales out of 39 at Superior; F. E. Behm, district manager, Lincoln district, whose district won the silver loving cup awarded to the district having the highest percentage of sales based on the quota. (This cup must be won three times in succession before it becomes the permanent possession of any district.) Next to Mr. Behm is Irene Swan, who made 16 sales at David City

in group No. 3; and Edith Hurst, Octavia, who won the prize in group No. 8 with nine sales.

Fred Johnson, Nebraska City, who won first prize in group No. 2 with 40 sales, is not in the photograph.

The quota for the entire territory was 1,560 sales, and the total sales made were 2,691. The first day's sales amounted to 531, which shows that the campaign was off with a flying start.

"The annual revenue development campaign which the Lincoln Telephone & Telegraph Co. held this year," says Publicity Director C. W. Motter, "was very successful, and it was undoubtedly due to the untiring efforts of all employes, of whom these nine in the photograph are representative."

The Telephone Central Office Dynamo—The Machine.

By JOHN A. BRACKEN.

For the purpose of charging the large storage batteries used to furnish a source of centralized electrical energy in the operation of a telephone system, a machine called a direct current dynamo is used.

Dynamos may be classified in various ways: First with reference to the electric currents produced; second, with reference to the number of field poles employed, as two-pole, four-pole, or multi-pole; and third, with reference to field winding, as series-wound, compound-wound, and shunt-wound.

Shunt dynamos are used to charge central office batteries almost exclusively because it is known that with these machines it is possible to vary the voltage between certain limits.

The term, "shunt," refers to the dynamo having its magnetic field winding connected across the armature leads or brush connections. In this type of dynamo the field coils are of comparatively high resistance as compared with the armature. The field ampere-turns of a shunt dynamo are the product of a very small current and many turns of wire, so that little of the electric current produced will be employed for their excitation.

To permit regulation of the voltage of the shunt dynamo, and consequently the current sent through the battery during the charging process, the current in the shunt field winding must be under control. This is accomplished by inserting a variable resistance, known as a field rheostat, in series with the shunt winding.

Decreasing the resistance in this rheostat, increases the current around the field coils, thereby increasing the ampere-turns, the number of lines of magnetic force cut by the armature and induced voltage in the armature winding. Inserting resistance in the rheostat lowers the voltage available at the brushes.

Series and compound dynamos are practically never used for charging batteries. With the series dynamo the voltage increases with the current generated. Hence, if by any means, say by a resistance inserted in the circuit instead of the battery, such a voltage is obtained at the dynamo as to get a certain current in the battery; then, on switching on the latter the E. M. F. of the battery will increase.

The result will be the difference between the E. M. F. of the dynamo and the back E. M. F. of the battery, and hence the current will decrease. Due to this smaller current, the E. M. F. of the series dynamo will now fall, and it might then happen that a current will flow back from the battery to the dynamo and reverse its polarity.

Compound dynamos are, for similar reasons, also very unsuitable for directly charging central office batteries. If, however, the voltage of the compound dynamo be higher than the maximum voltage of the cells, then with such a generator the cells may be charged by using suitable series resistance. In this case the dynamo voltage will not fall so low that a current will be sent back from the battery through the resistance to the machine.

These disadvantages of the series and compound dynamos are not to be found in the shunt dynamo, owing to the following: With decreasing current its voltage increases, and it can, therefore, hardly happen that its voltage would fall below that of the battery. Even if this should occur, for instance, through the dynamo driving motor, or other source of driving power, running more slowly, a current would flow from the battery into the generator in an opposite direction through the armature only.

The field magnet coils are in this case traversed by a current flowing in the same direction as before, the only difference being that the current comes from the battery instead of from the armature. Thus the polarity of the magnets is not reversed, and the reversal of the current does not cause any following injurious effect, as it would do with series or compound dynamos.

A general classification of the charging dynamo parts may be made as follows:

(1) Armature core.
(2) Armature winding.
(3) Commutator
(4) Brushes and brush holders.
(5) Magnetic field frame.
(6) Field winding.

These will be taken up separately in subsequent notes.

"The Chesapeake and Potomac Country," an Employes' Book.

During the past five years, The Transmitter, the monthly magazine of the employes of the Chesapeake & Potomac Telephone Co., Washington, D. C., has published a series of articles describing the various parts of the territory served by the company. Many of the articles were written by Oliver Martin, editor of "The Transmitter," and the others were edited by him.

In response to many requests of company employes and officials it was decided to publish these articles in book form. It was found, however, that many changes would have to be made, so the entire series was practically rewritten, leaving out much of the detail and statistics and adding information not available for the original articles.

The book as thus revised and condensed by Oliver Martin bears the title, "The Chesapeake and Potomac Country." It contains 312 pages and 62 pen and ink illustrations by Eustace Florance. It is not sold to the public, but employes of the Chesapeake & Potomac Telephone were given opportunity to purchase the book at a nominal price.

The title of the book is a happy selection. Every major unit of the territory served by the company—Maryland, Virginia, West Virginia and the District of Columbia—is touched by the waters of either the Potomac river or the Chesapeake bay.

The book is a particularly interesting one, for it gives an excellent picture of the history, development and growth of cities and sections located in a part of our country which is rich in historic events and full of present-day interest.

Mr. Martin has done a fine piece of work and employes of the Chesapeake & Potomac Telephone Co. are fortunate to have available to them such a well-written, interesting book, full of carefully-selected and accurate information concerning the territory with which they should be most familiar. The final chapter deals with the development of the telephone in the Chesapeake and Potomac country—a fitting conclusion for such an excellent volume.

Mississippi Telephone Man Swims Flood Waters to Clear Trouble.

During the high water this year in Mississippi, in order to prevent interruption of service on the toll line between Hattiesburg and Mobile, C. W. Moore, prorate manager at Lucedale, Miss., swam through the raging waters and succeeded in maintaining service.

At the point on the state line of Mississipi and Alabama, known as Dog River, the railroad bridge of the G. M. & N. Railroad had lost a span and the public highway had lost a section of the bridge. Immediately there was trouble on the telephone line and Mr. Moore set out to clear it.

Reaching Dog River, he found one of the poles had been washed out of the ground and was floating in 35 feet of water.

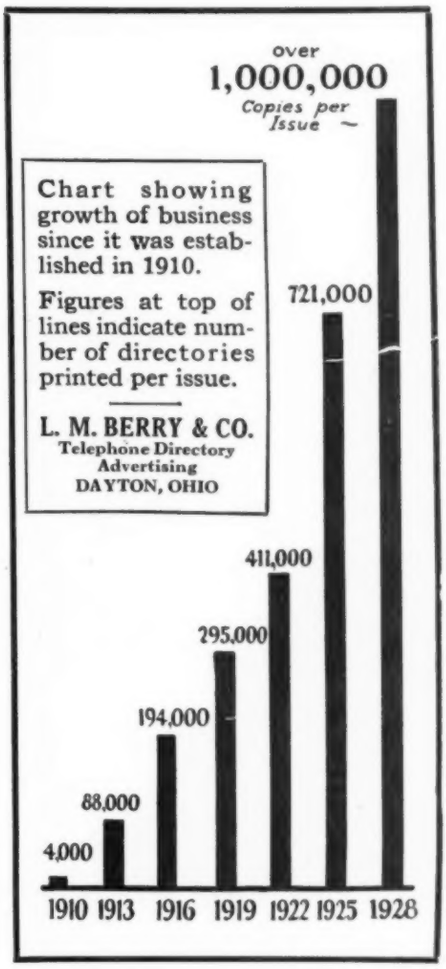
So Mr. Moore, procuring a good rope which he secured around his waist, swam out through the strong current to the pole, where he untied the wires from the cross-arms. The wires then rose above the water and service was maintained.

A Message to Telephone Executives—

STARTING in Marion, Indiana, in 1910, with a single telephone directory of 4,000 copies, this business has forged ahead steadily until it is now selling the advertising in telephone directories covering over 1,000 cities and towns in twenty States, with a combined circulation in excess of 1,000,000 copies per issue, and new territory is being added constantly.

There is one principal reason for this record of growth. It is because we have furnished our customers, the Telephone Companies and the advertisers, a valuable and necessary service on a basis both profitable and satisfactory to them. We have proved to Telephone Companies that the selling of telephone directory advertising is a business separate and distinct from the telephone business, and that our organization specializing in this one line can obtain far greater results than is possible from members of telephone organizations whose training has been along other lines.

Selling telephone directory advertising requires Salesmanship, because there are many other forms of good advertising available to business men, and in this respect it differs from the selling of telephone service, which is now non-competitive in all but a very few cities. We have an organization of salesmen who are experts in every branch of directory work, and who also know how to deal with the public, the subscribers of the Telephone Companies, in a manner which improves and builds up public relations. We consider this a most necessary and vital part of our service to Telephone Companies, and it includes careful attention to complaints of all kinds from subscribers, regardless of whether or not advertising space is contracted for.



We pledge to our present and future customers our best efforts to maintain our service at the highest possible standard, always seeking for further improvement.

If you have never used our organization to sell your Directory Advertising, try it starting with your next issue. Before we accept your directory work we will guarantee either to make or to save you money. Could any offer be fairer than this?

L. M. BERRY & CO.

Telephone Directory Advertising

Main Office: Keith Building, DAYTON, OHIO—Telephone Garfield 1670

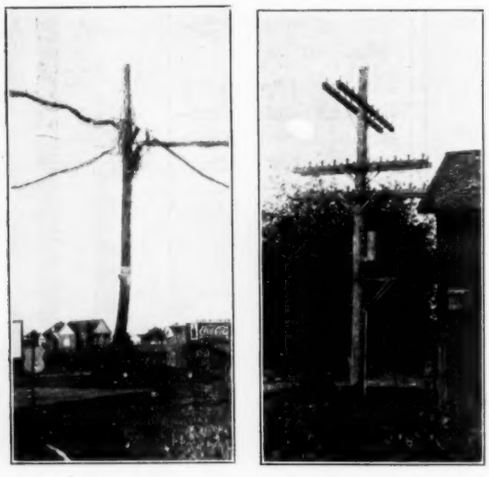
PHILADELPHIA	ROCHESTER	ERIE	FORT WAYNE	BRISTOL (TENN.)
135 S. Second St.	59 Stone St.	212 Hayes Bldg.	212 Guaranty Bldg.	1007 7th Ave.

With the Manufacturers and Jobbers

"Telephony" Ads Brings Inquiries from Canada to Cuba.

Records of the United Trust Co. at Abilene, Kans., show that as a result of regular advertising in TELEPHONY during the last two years, inquiries have been received from telephone companies in all parts of the United States, Canada and Cuba.

The introductory remarks of a new United Trust Co. folder entitled "A Complete Service" give full credit to TELEPHONY advertising for the widespread interest which Independent telephone companies have shown in the various services offered by the trust company. These services include management, engineering, accounting, financing, operation, publicity and legal.



Typical Views of an Actual Construction Job Before and After Work by Engineering Branch of Public Utilities Department, United Trust Co., Abilene, Kans.

Founders of the United Trust Co. are, in most instances, men interested primarily in public utilities. From their experience extending over a period of more than 30 years in operating, developing and managing Independent telephone companies, they are in a position to know the needs of the Independent utility operator and what remedy to apply in specific cases.

Stromberg-Carlson Radio Installation on Yacht.

Inasmuch as a yacht is a home on the water, it is not hard to understand how the radio receiver has enjoyed an ever-increasing popularity as a part of yacht furnishings. Boats that are large enough to erect a good antenna, as a rule, are provided with exceptionally fine entertainment, inasmuch as there are no obstructions to shield the radio waves, and in sailing vessels there is none of the electrical disturbance which often makes reception difficult for the city dweller. The Stromberg-Carlson Telephone Mfg. Co. has made a great many such marine installations.

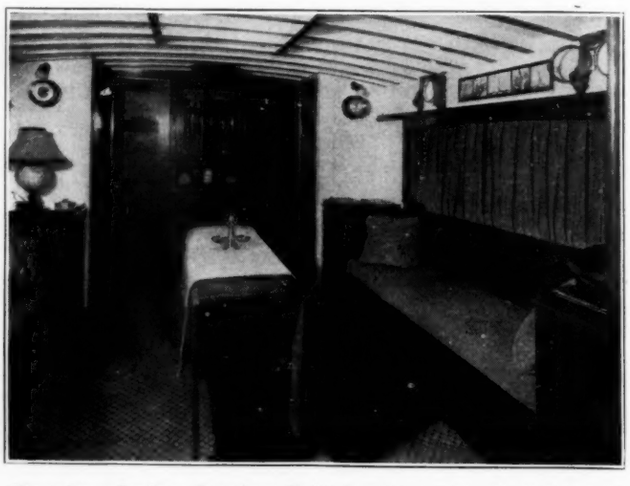
One of the newest is that which has been made in the 68-foot yacht of Walter Todd, of Rochester, N. Y. Mr. Todd is vice-president and general manager of the Todd Co., of Rochester, known the world over as manufacturers of Todd protectographs and safety check paper. The yacht has accommodations for ten people, a crew of three and seven passengers.

The Onaire II, as the yacht has been christened, is equipped with a Stromberg-Carlson No. 633 receiver and phonograph equipment from the Stromberg-Carlson No. 744 instrument, in order that both radio and record reproduction may be had.

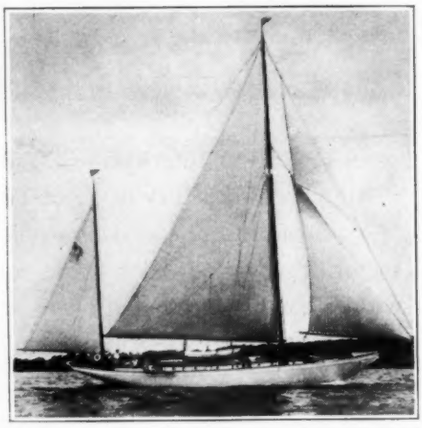
Space, of course, is always limited in a yacht, and everything must be made immovable in order that rough weather will not disturb the interior of the cabin. Consequently, the receiving set was built into the wall of the cabin, as shown in the illustration. The loudspeaker is mounted with its face downward from the ceiling.

The phonograph equipment is built into another corner of the cabin, the wire from the magnetic pick-up running beneath the floor to the receiving set to give phonograph records electrical reproduction.

The receiving set is battery operated, and runs off the yacht's power plant. Being a sailing vessel, there is no motor noise to disturb radio reception, while the yacht is in motion. There are two keys on the radio, one connecting it with the phonograph and the other cutting in a loudspeaker, located on deck.



Stromberg-Carlson Receiver Built in Wall of Yacht Cabin with Loudspeaker in Ceiling.



The 68-Foot Yacht, Onaire II., of Rochester, N. Y., Which Is Provided with Stromberg-Carlson Radio Receiver. The Antenna Is in the Hollow Main Mast.

A rather ingenious antenna arrangement has been made. The ordinary horizontal antenna, or one strung from the tops of the mast would be impracticable, inasmuch as sails are raised and lowered, and the wind causes the spars to sway back and forth. Consequently the aerial wire was run up through the center of the main spar. This spar, being hollow for the passage of ropes to the mast head, allows an ideal vertical antenna to be had.

"Wonder What the Pickpocket Got?" Ask George Rodormer.

"Who would have thought it?" said George W. Rodormer, of the Reliable Electric Co., Chicago, the other day. "After traveling all over this country and Canada for over 28 years, I had my pocket picked in my own home town."

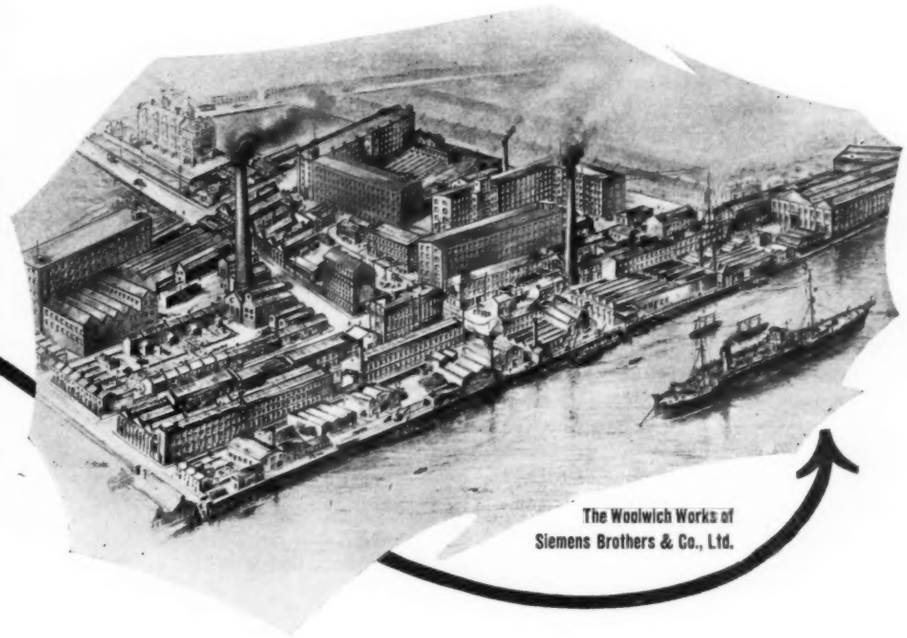
Mr. Rodormer then explained that a magnificent new movie theater seating 1,600 persons, had been opened in Park Ridge. He went to it on the first night, and found outside of it 3,000 of his fellow townspeople, plus some from Chicago, all determined to get into the building. Although Mr. Rodormer had on a long overcoat which was completely buttoned, the contents of one of his trousers pockets were completely removed without his having any knowledge of it. This doesn't seem possible, but George

SIEMENS

TELEPHONES

Established in 1858 in modest premises in Westminster, the firm transferred its Works in 1863 to Woolwich, where they have steadily grown until they now cover an area of over 27 acres.

The high quality of this Company's products, established many years ago, is fully maintained today.



The Woolwich Works of Siemens Brothers & Co., Ltd.

CONTRACTORS

FOR THE SUPPLY AND ERECTION OF

COMPLETE EXCHANGES

— AUTOMATIC AND MANUAL —

for

Public and Private Service in all parts of the world

SIEMENS BROTHERS & CO., LTD.

WOOLWICH, S. E., 18, ENGLAND

Representation Abroad: *Winnipeg, Rio de Janeiro, Cairo, Khartoum, Cape Town, Johannesburg, Melbourne, Sydney, Brisbane, Adelaide, Perth, Hobart, Wellington, Auckland, Tokyo, Tientsin, Harbin (Manchuria), Calcutta, Bombay, Madras, Ipoh (Perak F. M. S.), Kuala Lumpur, Singapore, Penang, Bangkok, The Hague.*

When writing to Siemens Bros. & Co., Ltd., please mention **TELEPHONY.**

vouches for it as a fact—and his word is generally accepted as good.

"It was a lucky thing for me," said he in telling about it, "that my pocket was picked at night rather than in the morning, for it was nearly empty at that time and the thief did not get much."

Highway Trailer Issues Catalog of Earth-Boring Equipment.

The Highway Trailer Co., Edgerton, Wis., has just issued a new catalog describing the Highway earth-boring equipment. This catalog describes only the earth-boring units and shows operation with truck and tractor mounted.

Because of the instructive and informative matter it contains this catalog should be in the files of those interested in labor-saving devices and those who are doing construction work.

Write the public utilities division of the Highway Trailer Co., Edgerton, Wis., for a copy of it.

Appointed Advertising Manager of Electric Storage Battery Co.

The Electric Storage Battery Co., Philadelphia, Pa., recently announced the appointment of Albert N. Dingee as advertising manager to succeed the late Alfred B. Kreitzburg. Mr. Dingee has been in the sales department of the company for the past 18 years.

Since 1920 he has been closely associated with the vice-president-sales manager, and in that capacity has been in active contact not only with the office he now assumes but with the company's large selling organization as well. He, therefore, brings to the position a wealth of experience that particularly qualifies him to handle his company's advertising problems and policies.

Keystone Exhibit at Philadelphia Show Draws Large Attendance.

Beginning on November 17, and continuing until the 24th, the Philadelphia electric and radio show was held in the Commercial Museum at Philadelphia. The show was sponsored and managed by the Electric Club of Philadelphia, a non-profit industry organization devoted to promoting interest in and use of electricity in its many applications. It drew a total attendance of 146,320 persons.

As one of the largest participants, the Keystone Telephone Co. of Philadelphia had an extensive and interesting exhibit, which attracted a great deal of attention and favorable comment. The Keystone company is one of the largest Independent telephone organizations in the United States using the Strowger automatic telephone equipment.

While owning and operating exchanges in other cities and towns besides Philadelphia, the largest number of its telephones are located in the business district of that city, where the speed and accuracy of the automatic service it offers has been a big factor in its securing the large amount of business which it controls. The slogan, "When the Keystone rings, it's a Business call," has been used extensively throughout the city.

The Keystone exhibit included a Keystone P-A-X (private automatic exchange) for the use of factories, offices, schools, hospitals, etc. This exhibition set was connected to give automatic telephone service to some 20 of the other exhibitors. An additional feature of the telephone exhibit was an attendant's cabinet with a girl in charge for the purpose of furnishing special supervisory and informational service. Thus the board was in continuous operation under actual working conditions, and gave spectators an excellent idea of how telephone calls are completed by means of the automatic apparatus, which is in such wide use for both public and private telephone exchanges.

View of Exhibit of Keystone Telephone Co. at Recent Electric and Radio Show in Philadelphia, Pa., which Attracted Great and Interested Attention.

Exhibits of the Strowger fire alarm system and the Strowger Tele-Chec system were also shown. The latter is an automatic system designed for the rapid and accurate transmission of numbers or codes. Designed primarily for use in theaters for transmission of signals between ushers and floor directors, the Tele-Chec has also been found useful in maintaining efficient operation in public garages, checking rooms, and similar places.

All of this apparatus was set up for operation, so that those interested could operate the dials and see exactly the operation of the complete mechanism. The now familiar hand-set type telephone, known in Philadelphia as the "Keystone executive telephone," was shown in various finishes and colors, and aroused considerable comment and interest.

Automatic Electric Inc., Chicago, collaborated with the Keystone company in furnishing material for the exhibit, which was rated as one of the best at the show. It was crowded continually with interested executives, assistants, operators, and other employes of industrial and financial organizations of Philadelphia and elsewhere.

Paragraphs.

JOHN W. COFFEY, president of the Coffey System & Audit Co., Indianapolis, Ind., reports that he is "coming back strong" after a recent operation at Rochester, Minn. He is now at his home in Indianapolis and hopes to be 100 per cent in a short time.

SUTTLE EQUIPMENT CO., Lawrenceville, Ill., received a request recently from the telephone company at Amoy, China, for its "Suttle Salesman," which the Suttle company believes, is a direct result of its advertising in TELEPHONY.

BELL LUMBER & POLE CO., Security Building, Minneapolis, Minn., is the name under which the Bell Lumber Co. is now known.

Radio-Telephony to Supplement Wires in British Columbia.

Plans are under way, according to U. S. Trade Commissioner E. G. Babbitt, Vancouver, Can., for the formation of a company to give long distance telephone service, by means of radio-telephony, to outlying districts of the province of British Columbia not reached by telephone wires because of physical difficulties and lack of sufficient business.

Under its charter the British Columbia Telephone Co. has no power to go into the radio-telephone business, but as this appears to offer the only practical method of giving service to many isolated points, it is proposed to form a new company. The name of the proposed company will be the Provincial Telephone Co., and a charter will be sought at the next session of the provincial legislature.

...the heart of it

IT has been said "that the power plant can be termed the 'heart' of any modern telephone system, for should it fail every telephone in the entire exchange would immediately cease to function."

And as a part of the guarantee of power, a *good* battery is an absolute necessity.

Universal Telephone Batteries are built to meet the test of telephone requirements. They give longer life and better service.

Write today for complete information on Universal Telephone Batteries.

UNIVERSAL BATTERY COMPANY
3408 South La Salle Street
Chicago, Ill.

Universal Batteries

Batteries for Every Purse and Purpose
AUTOMOBILE · RADIO · FARM LIGHT
Parts for all makes of Batteries
SHOP EQUIPMENT

When writing to The Universal Battery Co., please mention TELEPHONY.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

California Commission Declares for 7 Per Cent Return.

In one of the most important and precedential decisions rendered by it since the World War, the California Railroad Commission, on December 5, found unanimously that a rate of return of 7 per cent per annum on the capital invested, in the case of a stable and established utility like the Southern Counties Gas Co. is reasonable, instead of allowing a return of 7½ or 8 per cent, as heretofore. This action was taken in fixing the rates for service of natural gas in Ventura City and county by that utility.

The decision is of widespread importance by reason of marking a precedent in favor of a 7 per cent rate of return on the capital invested by a public utility, in view of the "marked decline in the cost of money" during the last few years. The commission held that with the lower rate of return it would be possible for the utility to obtain the needed capital to function properly.

Reviewing the company's operations under the old rates the commission makes the following statement on the subject of rate of return in its decision:

"Evidence introduced shows that the rate of return in the Ventura district for the 1927 operations was in excess of 12 per cent. The probable revenue under present rates and rate base, operating expenses, etc., found reasonable indicates that the rate of return would, if present rates were left undisturbed, be slightly in excess of 10 per cent for 1928.

The continuation of a rate structure which will yield such a return is clearly unwarranted. Rates which will result in a return of 7 per cent upon the capital invested are adequate for the proper functioning of this utility and, in view of the marked decline in cost of money during the past few years, such a return is fair and reasonable."

Data Presented by Commission Engineer in San Francisco Case.

The following data was presented by A. B. Fry, telephone and telegraph engineer of the California Railroad Commission, in the commission's hearing on the application of Pacific Telephone & Telegraphic Co. for an increase in rates for its San Francisco and East Bay exchanges:

"Telephone exchanges in California vary greatly in size and importance. As of December 31, 1927, some small Pacific exchanges had as few as three or four connected telephone stations, while the number in the East Bay exchange was 114,504. San Francisco exchange 237,942, total San Francisco and East Bay exchanges was 352,446, and the Los Angeles exchange of the Southern California Telephone Co. had 333,971 stations.

The areas of these exchanges vary from some 8¼ acres (600 feet square) to 60.4 square miles (56.5 square miles proposed) for San Francisco, 133 square miles (120.9 square miles proposed) for the East Bay exchange and about 210 square miles for Los Angeles.

There were some 437 Pacific exchanges in California as of December, 1927, and 25 controlled company exchanges.

Independent exchanges in California, numbering approximately 171, had some 119,585 connected telephone stations.

The Pacific system in California had about 1,008,782 company and 21,094 service stations, a total of 1,029,876 stations using Pacific system exchange service in California. The controlled companies had 42,328 company and 1,068 service stations, a total of 43,396.

Independent exchanges in California had from a half-dozen stations to about 26,000 for the Long Beach exchange of the Associated Telephone Co.

Pacific toll revenue is spread over or prorated to the many Pacific exchanges and toll commissions are paid to the Independent companies. In this proceeding we are dealing with two of the 437 Pacific, or of the 462 system exchanges in California."

Personal Injury Judgment Reversed by State Supreme Court.

Where a telephone operator sued for personal injury sustained at the switchboard and the company contended that the plaintiff could not sue because the company had elected to come under the workman's compensation act, the instruction given the jury by the lower court as to places of posting notices of such election, was held erroneous and the judgment for the plaintiff reversed. McVey v. Chesapeake & Potomac Telephone Co. of West Virginia (W. V. S. C. App. November, 1928).

This was an action by a telephone operator for personal injuries received while operating a switchboard of the defendant company. The company contended that the plaintiff could not sue because it had elected to take the benefit of the workman's compensation act and had in all respects conformed thereto, and had posted and maintained in conspicuous places at its place of business and in the building where the plaintiff was employed, printed notices on its election to pay for injuries under the act. The plaintiff contended that the notices were not posted in conspicuous places as required by the act. Judgment entered on the jury's verdict was reversed.

The syllabus of the West Virginia Supreme Court was as follows:

"The posting of typewritten or printed notices by an employer in conspicuous places about his place or places of business stating that he has elected to comply with the workman's compensation act as prescribed in section 23, chapter 15P, code, should be liberally construed as to the conspicuousness of the places where posted, in order to effect the beneficent purposes of the act.

An instruction which tells the jury, in substance, that such notices should be posted and kept posted about the employer's place of business where the employe is at work, open to view, unobstructed and easily seen, as well as while going to and from the employment, is erroneous."

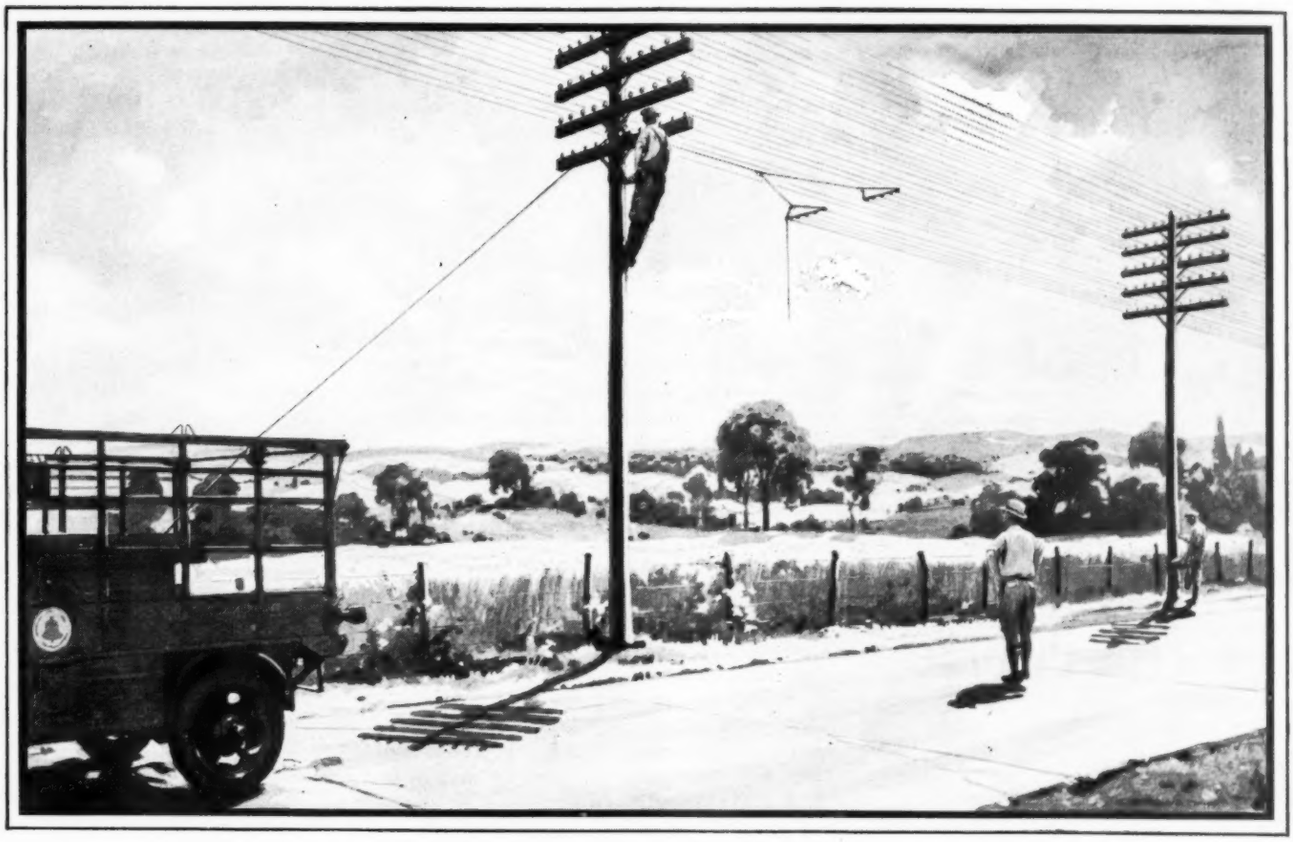
Company Not Liable for Damages Caused by Falling Pole.

In a decision entered October 23, the Superior Court of the Province of Quebec, at Montreal, Can., in the case brought by Charbonneau et al. against Piorier, Landry and the Bell Telephone Co. of Canada, held the telephone company not liable for injury to the plaintiff caused by a falling pole, which was partly rotten. It was struck by a vehicle drawn by frightened horses, and broken off.

The plaintiff alleged that she was coming out of church after a funeral service and that the horses on the hearse became frightened and struck a telephone pole. The pole, which carried no wires, was rotten and fell, striking the plaintiff, who alleged that the company was negligent in leaving such a pole in position. She sued the telephone company and the undertakers, who had provided the horses.

The company alleged that the pole was one of a line which had been lawfully erected by it under its statutory powers and prior to the building of the sidewalk and church, and that the pole was still in proper condition.

The court found that the line of poles had been lawfully erected; that the wires on the pole had been removed just a few days previously to the accident and that an employe had to climb the pole from 20 to 30 feet and in so doing had thrown his weight out, "which was a good test as to the solidity of said pole." The determining cause of the accident was the



The U. S. A. is only a few minutes wide

An Advertisement of the
American Telephone and Telegraph Company

In the gold rush year of '49 a stage-coach succeeded in crossing the continent in about three months. Two decades later, for the first time, an unbroken stretch of railroad lay from New York Harbor to San Francisco Bay, and America was seven days wide. Today, by telephone, that entire width is only a matter of minutes. And these few minutes represent a round trip, taken in the ease of office or home.

The Bell System is ever busy reducing the width of America and the distance between cities. For example, during 1929 it will add to its lines nearly 2,000,000 of the new permalloy loading coils for correcting and maintaining the speeding voice-currents.

Seven thousand miles of new inter-city cable, $40,000,000 worth, will be added to the System to protect against storms and other slowing up influences.

In the last five years 350 major improvements, as well as thousands of others whose aggregate importance mounts high, have been made in telephone central office equipment.

Improved operating practices have eliminated the necessity of your "hanging up" and being called back in 95 per cent of toll and long distance calls, adding new speed and ease to out of town calling. You hold the wire and the operator does the rest.

Since New Year's Day, 1927, the average time for completing all out of town calls has been cut 35 per cent and at the same time the per cent of error has been further materially reduced.

There is no standing still in the Bell System. Better and better telephone service at the lowest cost is the goal. Present improvements constantly going into effect are but the foundation for the future's greater service.

"The Telephone Books are the Directory of the Nation"

When writing to American Telephone and Telegraph Company, please mention TELEPHONY.

striking of the pole by the hearse when the horses became frightened, the court found.

In the circumstances, no fault could be attributed to the telephone company, and the court therefore dismissed the action as to the telephone company, but gave judgment of $250 against the undertakers.

Tax Valuations Urged As Factor in Indiana Rate Making.

Public utility interests in Indiana have another worry staring them in the face for the coming session of the Indiana legislature. Frank Singleton of the Indiana Public Service Commission, has just announeed that he will urge passage of a law by the 1929 legislature which will make tax valuations of utility properties recognized as prima facie evidence of between 75 and 80 per cent of actual value for rate-making purposes.

Utilities now stress before the commission the importance of replacement new as the only evidence of value in making rates. Commissioner Singleton took a rap at this theory recently. He cited nine things which he considered important in arriving at fair value of utility property for rate-making purposes. Among them was the tax valuation, which is a new worry to utility interests. Should the law pass as he proposes, this factor will take on great importance.

"I have heard it advocated that a law be passed to make tax valuation the basis for rates," he said, in explaining the proposal. "I do not believe that such a law would be upheld by the courts, even if it could be passed. My proposal to make the tax valuation represent at least 75 per cent or 80 per cent would be more likely of both passage and court approval.

"Fair value should be fair to the utility as a basis of return, and as fair to the utility's patrons as a basis upon which they must pay the rates prescribed."

Evidences of fair value as listed by Mr. Singleton in his statement are as follows, in the order of their importance in his judgment:

1. Estimated cost of reproduction, new, less actual depreciation, plus going concern value and working capital.
2. Historic cost as shown by utility's books, adjusted.
3. Fair value, as indicated by appraisal for purposes of taxation by taxing authorities.
4. Price paid for utility property, or common stocks representing the property, by its owners within a reasonable period of time of inquiry.
5. Previous valuation of the utility property for any purpose, plus net additions and betterments, adjusted at the time of inquiry to the trend of prices at such time and for a reasonable period immediately preceding.
6. Expected trend of prices for a reasonable period in the future.
7. Value to patrons of the service rendered and which will be rendered.
8. Cost of rendering service, plus a reasonable return of the fair value.
9. Amount of money taken from the depreciation reserve and invested in the utility property.

While no statement has been made by other members of the commission, it is believed that most of them will concur with Mr. Singleton in any effort to make the tax valuation of utilities within the state a partial basis, at least, for fixing the valuation for rate making purposes. The present commission in the last few months has been rather reticent about advancing rates and has announced at different times that the members were opposed to a continuous increase in rates, which they claimed to have been the rule.

Bloomfield, Neb., Agrees to Rate Increases; New Ownership.

J. T. Coffey, the new owner of the Bloomfield Telephone Co. in northeastern Nebraska, has tamed the hearts of fire of the recalcitrant telephone users in that section, and has secured the signatures of 80 per cent of his subscribers to a rate increase.

Bloomfield was once owned by the Union Telephone Co., of Wausa, but after the company had rebuilt the exchange and asked for a modest increase in rates, hotheads organized a strike that lasted for months, and which was finally won by the subscribers.

The Union company sold to two local men, one of them its manager, who sought for several years to give service at the old rates, on the reinstallation of which most of his subscribers came back. The new owners were unable to make any profit out of the rates, and were not able to take care of depreciation properly. Some six months ago they sold out to Mr. Coffey, and he has been spending considerable time and money reconstructing the lines and bettering the service.

In discussing the matter of a rate increase with Chairman Randall of the commission, he was advised that in view of the temper of the community on the previous occasion and also as a matter of good business policy, he should first seek to sell the idea of better rates for better service. He has been successful in this, and is preparing to ask for the necessary schedules.

Commission Annuls Former Order Granting Increased Rates.

The Minnesota Railroad & Warehouse Commission, in an order issued December 4, annulled its order made May 24, 1928, granting an increase in rates to the New Richland Telephone Co., operating exchanges at New Richland and Waldorf, and denied the petition of the New Richland company for an increase in rates.

Keeping Faith
with **THE PUBLIC**

MAINTAINING the finest service possible is but the every day duty of a telephone company in carrying out its contract with the public.

"Keeping faith" simply means "use good judgment in the selection of your equipment."

STORM KING batteries have developed a new insulating material, more highly absorbent than any other, which will retain the chemical solution much longer than anything so far developed. The result is the longest service life ever developed in a telephone battery and this in turn means substantial savings to telephone companies in cutting down renewal costs to a new low point.

Manufactured by
GENERAL DRY BATTERIES, INC.
Cleveland, Ohio

Distributors:
A. J. Johnson Elec. Co., Chicago, Ill.
W. S. Nott Company, Minneapolis, Minn.
Suttle Equipment Co., Lawrenceville, Ill.

Fully Guaranteed

Size: 12"x9"x5"

TELERING

THE SUPER FREQUENCY CHANGER

For All Telephone Ringing Purposes in Any Capacity from a P. B. X. to the Largest Central Office

Directly Converts 60 Cycle Lighting Current to 20 Cycle Ringing Current

DOES NOT INTERFERE WITH RADIO RECEPTION

- Simple
- Low First Cost
- Self-Starting
- Self-Contained
- Ideal Wave Form
- Negligible Upkeep
- No Parts to Renew
- Will Not Puncture Cable Insulation
- Will Not Break Down Key Insulation
- Keeps Ringing Leads Out of Cables
- Eliminates C. O. Distributing Equipment for P. B. X. Ringing
- Short-Circuiting Is Harmless
- Will Not "Noise" Cables

FIRST COST IS PRACTICALLY THE ONLY COST
INSTALL IT — THEN FORGET IT
IT PAYS FOR ITSELF

Price $40.00 Complete
F. O. B. ELYRIA

Sold by the Leading Supply Houses

ONE REED!
ONE CONTACT!

Manufactured by

THE COLSON COMPANY

Elyria, Ohio

Established 1885

Cope Specialties

- Conduit Cleaning Tools
- Concrete Cutters
- Cable Racks
- Cable Rack Arms
- Cable Reel Jacks
- Cable Drawing Guides
- Cable Drawing Protectors
- Cable Duct Shields
- Cable Pulling Rope
- Guard Rails

COPE Quick Coupling Conduit Rod is outstanding for its many salient features. It is designed for strength, durability and quick installation. They will not come uncoupled in the duct.

Send for copy of our new catalog.

T. J. COPE

Manufacturers of

Complete Equipment for Cable Installation

2112-14 Sansom Street, Philadelphia, Pa.
19 South La Salle Street, Chicago, Ill.

Crapo
Galvanized Products

Telephone and Telegraph Wire

Steel Strand

A sleet storm.... Miles of line down.... Wire stocks inadequate .... Rush shipments imperative.... Then look to Jobbers of *Crapo* Galvanized Wire and Strand.... You can depend upon them in every emergency.... and they, in turn, can depend upon us....for they know from experience that RUSH orders received by us in the morning are shipped before night....

Indiana Steel and Wire Company
Muncie, Indiana. U.S.A.

Following are the net monthly rates authorized in the May 24 order, which were to become effective June 1:

	New Richland	Waldorf
Individual line, business	$2.50	$2.25
Individual line, residence	1.75	1.50
Rural multi-party	1.50	1.50
Hall, churches and lodges	1.00	1.00
Business or residence extensions	.50	.50
Rural switching	.35	.35

The New Richland company is now charging rates for service as prescribed in the commission's order of March 30, 1920, which are:

	No. of Subscribers	Gross Rate	Net Rate
New Richland exchange—			
Individual line, business	53	$2.50	$2.08⅓
Business extension	10	....	.50
Individual line, residence	171	1.75	1.33⅓
Residence extension line	10	....	.50
Rural multi-party	496	1.75	1.33⅓
Rural switching	..	....	.50
Halls, lodge rooms, churches, etc.	10	....	1.00
Company stations	4	....	....
Waldorf exchange—			
Individual line, business	20	2.50	2.08⅓
Business extension	4	....	.50
Individual line, residence	25	1.75	1.33⅓
Residence extension	..	....	.50
Rural multi-party	121	1.75	1.33⅓
Rural switching	..	....	.50
Halls, lodge rooms, churches, etc.	..	....	....
Company stations	1	....	....

All rates to be billed gross excepting where quoted net; all gross rates payable monthly in advance with a discount of 25 cents per month if paid on or before the 15th of the month in which the service is rendered, except that multi-party rural rates are payable quarterly in advance, with a discount of 75 cents if paid on or before the 15th of the first month of the quarter; a discount of 50 cents if paid on or before the 15th of the second month of the quarter; a discount of 25 cents if paid on or before the 15th of the third month of the quarter.

By letter of January 4, 1922, authority was granted to change the discount date from the 15th of the month to the last day of the month, and also to grant an additional discount of 50 cents per quarter on main station service where payment is made quarterly in advance during the first month of the quarter.

Subsequent to the order, about June 20, 1928, the New Richland company filed an application to amend the order to include service connection and miscellaneous charges, effective July 1. The commission ordered a rehearing upon the questions involved and upon the rehearing, the evidence previously offered was reoffered, together with additional proof by the New Richmond company, and after consideration of the matter the commission found:

That a detailed field inventory and appraisal of the plant and property made by J. G. Wray & Co., of Chicago, Ill., showed the reproduction cost new of the plant and property of the New Richland company to be $144,965, its per cent condition 75.4, and the reproduction new less depreciation of the plant and property of the petitioner, $109,260, all as of November 1, 1926.

That the book cost of the property which the New Richland company believes to represent the minimum cost of the plant and property, was, on June 30, 1927, $69,244.61.

That the reasonable worth and value of the plant and property does not exceed the sum of $55,000; that the evidence is insufficient to justify a finding by the commission that the cost of reproduction of the plant and property of the petitioner is the sum of $144,965; that the book cost of the plant and property of the New Richmond company is $69,244.61, but that the proof is insufficient to justify the commission in finding that the value is that sum and that the value does not exceed the sum of $55,000.

The proof was insufficient, the commission believed, to justify a finding that the sum of $4,000 as working capital should be added to the value of the plant and property, and to warrant the commission in finding that the total reproduction cost new less depreciation is the sum of $113,260, and that the minimum original cost is the sum of $73,244.61, or an average cost per station of $161.04 and $79.61 respectively.

A 7 per cent dividend was declared during the years 1923, 1924, and 1925, the commission found, although an indebtedness of $3,000 existing in 1923 had shrunk to but $500 in 1927.

After its consideration of the matter, the commission found that the order made on May 24, 1928, should be annulled, vacated and set aside and the petition of the New Richland company for an increase of rates be denied.

What Are Your Telephone Needs?

WE have had more than thirty years' experience in financing—organizing and operating telephone companies. That experience enables us to offer you a real, authoritative service. Upon the ability that we have shown in those thirty years, may we request the privilege of taking up the matter of refinancing your organization? Our newest booklet "A Complete Service" completely describes our plan of financing and operating telephone companies. Send today for your copy—no obligation; no expense.

PUBLIC UTILITIES DEPARTMENT

UNITED TRUST COMPANY

ABILENE - - - KANSAS

Nebraska Directors Severely Criticized by Commission.

Certain directors of the Bartley Mutual Telephone Co. were severely castigated by Chairman Randall of the Nebraska State Railway Commission when that company asked for a hearing on a complaint that the Cambridge Telephone Co. had refused to make an equitable division of tolls.

Mr. Randall consented to hear Manager Clark, who has always treated the commission with courtesy, but he took occasion to say that certain of the directors had been open and contumacious in refusing to obey orders of the commission with respect to the charging of gross and net rates, and said that if he had the power he would cite them for contempt. He may later bring them into court in an action to enforce the order.

Value of Company Determined; Increased Rates Approved.

The Coos Telephone Co. has been authorized by the New Hampshire Public Service Commission to place in effect in-

the last 50 to 100 ft.—the drop wire—is as important as the miles of line back of it. Any failure of the drop wire destroys the usefulness of the entire line as far as the subscriber is concerned.

Assure uninterrupted service all the way to the subscriber's station with

"COPPERWELD" "Ecco Brand" Insulated Twisted Pair Drop Wire

THE LONG LIFE DROP WIRE

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creased rates for service at its exchanges at Berlin and Littleton.

Individual and two-party line business service was increased $1 per month, and rural line business 17 cents per month. Individual and two-party line residence service was increased 25 cents per month. Four-party residence service at $2.25 per month was established in place of the six-party service.

The company presented in evidence a valuation of its property made by its engineer, in which the reproduction cost new was placed at $823,159, and after adding allowances for overheads, working capital, a total reproduction cost new of $1,076,857 was arrived at.

After deducting existing depreciation, $858,053 was the figure fixed, to which $145,000 was added for net additions under the company's reconstruction program for 1928, making the total cost of reproducing the property, $1,003,053. The engineer further testified that the fair present value of the property, in his opinion, at the time of the hearing, was $950,000.

The company's engineer testified that for the first full year of operation under the proposed rates, the company would receive in Berlin, $7,000 of added revenue. The company's accountant testified that, based upon the engineer's valuation and considering the added revenue to be derived from the new rates for service at both exchanges, the return to the company for the first full year of operation would be about 4.218 per cent.

The company's engineer further testified that the capital expenditures at the Berlin exchange, since there had been any increase in rates for service in that city, had increased the company's capital charge more than $17,000 per year.

Exchange of Wisconsin Telephone Co. Allowed Increase.

Increased rates at the Whitewater exchange of the Wisconsin Telephone Co. were recently authorized by the Wisconsin Railroad Commission. Following are the old and new net monthly rates:

	Old	New
One-party business	$3.50	$4.25
Two-party business	3.00	3.50
One-party residence	2.00	2.50
Two-party residence	1.75	2.25
Four-party residence	1.65	2.00
Rural business	2.00	3.00
Rural residence	2.00	2.00

The investment in the exchange property as of 1927, as contained in the company's annual report to the commission, plus a prorate of the Milwaukee general investment properly assignable to the Whitewater exchange, was found to be $102,422.30.

The commission's computations indicated that the exchange should have earned $12,167 in 1927, in order to have provided properly for depreciation and to have allowed an adequate return on the invest-

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The Board of Directors of the Associated Telephone and Telegraph Company have declared the regular dividend of $1.75 per share on the First Preferred Stock; $1.00 per share on the Class "D" Stock; $1.00 per share on Class "A" Stock; $0.75 on the Class "C" Stock for the quarter ending December 31st, 1928, all payable January 1st, 1929, to stockholders of record at the close of business December 20th, 1928.

G. L. GRAWOLS, Treasurer.

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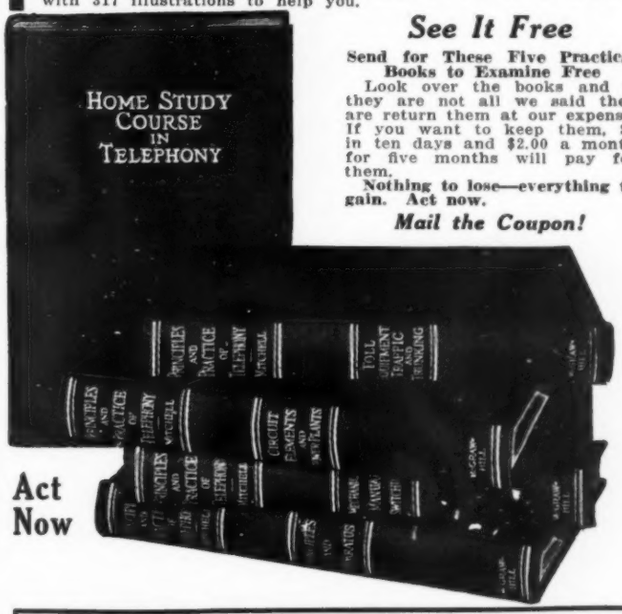

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ment, but the actual earnings of the exchange were $6,182.95. This shortage, however, gives effect to the payment made to the American Telephone & Telegraph Co. under the licensee contract.

The 1927 results of operation, after adjustments for maintenance and licensee payments were made, the commission found, indicate a need for increased revenue of approximately $4,315 before making provision for the increased state and federal taxes on the increase in revenue, and about $4,750 after these provisions.

The rates which the company proposed, the commission found, would increase revenues by about $7,700, which is more than the needs of the exchange and therefore were not approved without some modifications.

Commission Grants Increase; Disagrees on Valuation Basis.

The Nebraska State Railway Commission has authorized the Lincoln Telephone & Telegraph Co. to increase its rates at its Wymore exchange 25 cents a month on residence service, 50 cents a month on individual business, and to give a two-party residence service for $1.75 instead of four-party for $1.50. Rates for ten-party business, $2.25 and ten-party residence, $1.75, remain as before as do the $1.00 charge for business and 50 cents for residence extensions.

Since the application was filed the company has constructed an exchange building of its own and moved out of rented quarters, and has installed a new switchboard and office equipment. The exchange is now complete common battery. A total of 522 stations is served.

The commission and the company engineers disagreed upon the basis of valuation of the property in use, varying methods being used. The company appraisal was based on the hypothesis that there was no exchange there, and built up values on the basis of engineering and supervision costs, costs of financing and deficits from operation for the first two years.

The commission declined to accept this, holding that parallel situations in actual practice do not exist, and that a theory to be consistent must be in substantial agreement with experience. That experience is that exchanges grow from small beginnings and develop slowly. The order discusses the various methods of valuations and allowances for depreciation, and adopts those which, allowing for increased cost of material, warrants a finding that the property is worth $60,000; that 2½ per cent on the building and 5½ per cent on all other depreciable property will meet all requirements.

The commission and the company also locked horns on the question of what allowance should be made for possible loss of subscribers due to increased rates. The commission thought that the company's figure of $1,607 decreased income was too high and outside of the pale of experience. The commission thinks it will not exceed 5 per cent. The company desired a 75 per cent increase in business rates, but this was cut to 50 cents.

The commission estimates that the gross revenues under the new schedule will be $18,735, which will leave approximately $4,500 net, not counting any loss from subscribers who may quit, which it thinks is a fair return on the fair value. The new rates became effective December 1.

Value of Ohio Company Determined by Commissioner.

Tentative valuation was placed on the property of the Crescent Telephone Co. by the Ohio Public Utilities Commission recently, when the company filed schedules proposing increased rates and charges for service in its Bowerston, Sherrodsville and Tappan exchange areas.

The commission found the reproduction cost of the physical property to be $45,-170.40, and the reproduction cost, less depreciation, to be $33,725.82. To the reproduction cost there should be added 7 per cent, or $3,161.93 for overheads and 5 per cent, or $2,416.62 for working capital and supplies, making a total reproduction cost new of $50,748.95.

To the reproduction cost new, less depreciation, $2,360.81 should be added for general overheads and $1,804.33 for working capital, including supplies, making a total reproduction cost new, less depreciation, of $37,890.96. No additional allowance was necessary for going concern value.

Bell Company Takes Over Properties in New York.

The New York Telephone Co. was recently authorized by the Interstate Commerce Commission to take over the telephone properties of James R. McAllister, the principal owner of an exchange at Palenville, which serves 143 subscribers in parts of Ulster and Greene counties, New York.

The territory served by the Palenville exchange, the commission found, is in the Catskill mountain region and is a resort for vacation visitors. To provide satisfactory terminal facilities for the large seasonal increase in toll traffic, more liberal provision for exchange plant is required than would be necessary for local service.

The present owner of the exchange is unwilling and unable to provide proper plant and equipment, the commission found. The Bell company estimates that the required repairs and extensions will cost $20,000, and represents that it is prepared to make the necessary extensions immediately.

On September 25, 1928, the Bell company made a contract with James McAlister and others having an interest in the telephone properties at Palenville, to purchase the properties for $4,500, plus the value at the time of the sale of the net additions, if any, in fixed capital assets made subsequent to April 30, 1928, and up to the closing of title.

An appraisal made by one of the Bell company's engineers found the reproduction cost new of the properties to be $13,456 and less depreciation $5,212. The estimated value of property to be retired from service is $1,855, and the cost of removing the retired property is expected to exceed its salvage value by $610.

In 1927, operating revenues of the properties at Palenville were $3.628.60, and operating expenses and taxes totaled $2,-847.56. Upon acquiring the properties the Bell company will put into effect its standard basic monthly rates applicable to the Palenville territory, which are somewhat higher than those now charged for some classes of service.

Additional Stock Issue Authorized by Wisconsin Commission.

The Oakfield Telephone Co., Oakfield, was recently granted permission by the Wisconsin Railroad Commission to issue common stock to the amount of $12,000, the funds derived therefrom to be used for the purpose of completing the payment of the purchase price of the property of the Rosendale Telephone Co., owned by Frank Gruett.

The value of the property to be acquired by the Oakfield Telephone Co., the commission found, is $17,000. By a former order the company was authorized to issue $5,000 par value common stock. Since it appeared to the commission that the Oakfield company was entitled to a further certificate, the issuance of $12,000 of additional common stock was authorized.

Toll Line Transfer Authorized by Wisconsin Commission.

The Wisconsin Railroad Commission recently granted the application of the Wautoma & Mount Morris Farmers Telephone Co., Wautoma, to acquire certain property of the Coloma Telephone Co. for the sum of $1,103.50.

The property sold to the Wautoma & Mount Morris company consists of approximately one-half of a grounded toll line between Coloma and Wautoma, including the grounded rural circuits serving nine subscribers. The purchasing company intends to make the lines metallic as soon as possible.

When metallic service is furnished, the Wautoma & Mount Morris company will have ample authority, the commission stated, to charge $20 net per year instead of the existing rate of $18 per year.

Summary of Commission Rulings and Schedule of Hearings.

INTERSTATE COMMERCE COMMISSION.

November 28: Acquisition by the New York Telephone Co. of the telephone properties of James R. McAllister et al., lo-

cated in Ulster and Greene counties, N. Y., found to be of advantage to the persons to whom service is to be rendered and in the public interest.

December 18: Hearing at Washington before Examiner Davis in the matter of the proposed purchase by the Mountain States Telephone & Telegraph Co. of certain telephone properties of Otto Schulz located in Montana, consisting of an exchange with approximately 108 subscribers' stations at White Sulphur Springs, Meagher county, operated under the name of Springs exchange. Also telephone property in Wilsall, Park county, operated under the name of Wilsall Telephone Co., consisting of approximately 49 subscribers' stations and 20 miles of metallic circuit.

December 18: Hearing at Washington before Examiner Davis in the matter of the proposed purchase by the Mountain States Telephone & Telegraph Co. of the properties of the Uintah Telephone Co., with exchanges at Vernal and Roosevelt, and toll lines and switching stations.

ALABAMA.

November 26: Order issued authorizing the Thorsby Telephone Co. to construct and operate a telephone system at Thorsby in Chilton county.

CALIFORNIA.

December 7: Del Norte Peoples Telephone Co., serving Crescent City and western Del Norte county and northwestern Humboldt county, applied for authority to file its present schedule of rates which have been in effect since authorized by the Postmaster General of the United States in July, 1919.

December 7: Chetco Southern Telephone Co., serving the town of Smith River and western Del Norte county, asked for authority to file its present rate originally authorized by the Postmaster General in 1919.

December 7: West Coast Telephone Co. of California applied for authority to issue 7,425 shares of its capital stock, par value $25 per share, for the purpose of paying for the properties of Del Norte Peoples Telephone Co. (5,895), Chetco Southern Telephone Co. (530), Marshall P. Madison (996); and also authorizing West Coast Telephone Co. to issue and sell shares of its capital stock in payment of the properties of Klamath Telephone & Telegraph Co., and to pay $1,000 in cash for the properties and franchises of Butte Valley Telephone Co.

December 7: Nevada, California & Oregon Telegraph & Telephone Co., which recently acquired the so-called Bass Telephone Lines, in Shasta county, applied for authority to establish its own service rules and regulations and service charged in place of those formerly charged by the Bass System.

ILLINOIS.

December 11: Hearing at Chicago before Commissioner Smith in the matter of joint application for the approval of purchase by the Illinois Northern Utilities Co. of the telephone property of the Astoria Telephone Co. in Astoria and vicinity, also for a certificate of convenience and necessity to the Illinois Northern Utilities Co. to operate the property.

INDIANA.

December 3: The Northern Indiana Telephone Co. of North Manchester filed petition asking for authority to purchase the properties of the Fulton Telephone Co. of Fulton, and the Citizens Telephone Co. of Macy. The petition set out that the Fulton Telephone Co. property is valued at $25,000 and that of the Citizens company at $35,000. The Northern Indiana company also asked permission to issue $34,000 in gold notes and $14,000 in preferred stock, both bearing 6 per cent interest, to obtain part of the funds necessary to make the purchase.

December 3: Order issued granting, in the main, a schedule of rates sought by the Clay County Telephone Co., the petition previously having been denied by the commission and appealed to the federal court. Two of the commissioners dissented from the order, which grants a schedule of rates based on a fair valuation of $400,000.

The only instance in which the approved rates differ from those sought was in the case of rural service, the commission fixing a rate of $1.75 a month instead of $2. Following the first hearing the commission wrote an order on the understanding that the company was seeking a return based on investment. Appealing the case to the federal court, the company denied this and the case was sent back to the commission. The new commission order also allowed the company a 4 per cent allowance for depreciation.

December 4: Petition filed by Home Telephone & Telegraph Co., of Fort Wayne, asking authority to buy the properties of the Noble County Telephone Co., of Albion. The Fort Wayne company also operates exchanges in New Haven, Churubusco, Roanoke, Leo, Harlan, Grabill and Huntertown, and the Noble County company has properties in Albion and Kimmell.

December 4: Order issued recommending that the Southern Indiana Telephone & Telegraph Co., of Seymour, restore free service to St. Meinrad's Abbey. In a complaint to the commission about the discontinuance of free service, it was

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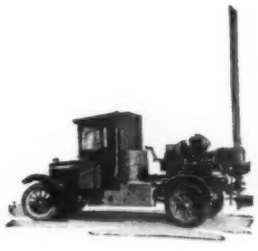

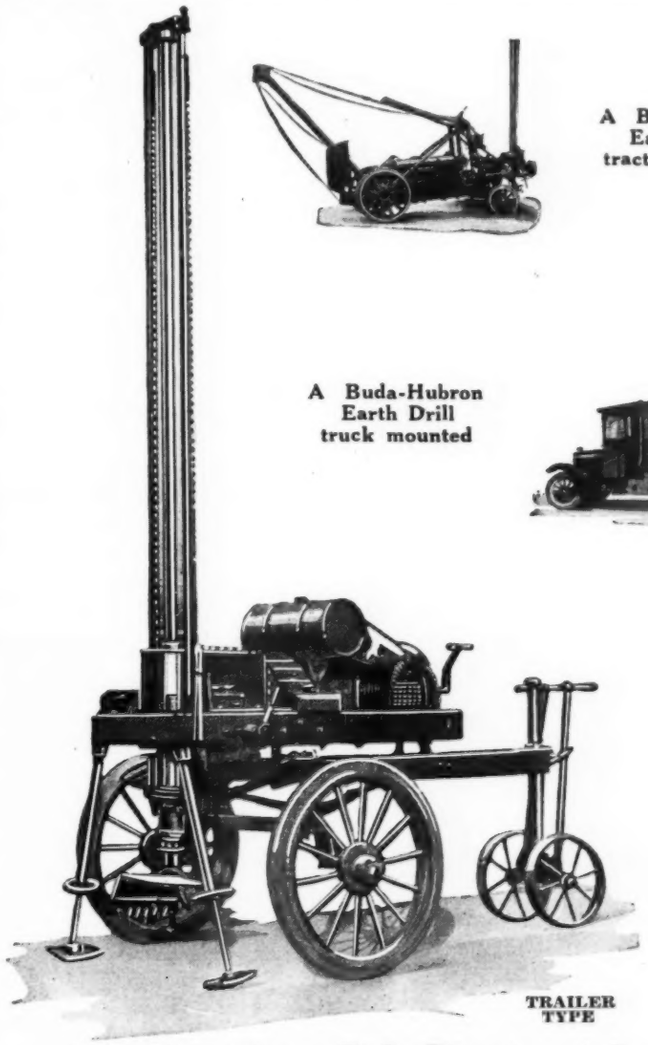

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KANSAS.

December 28: Hearing at Piper on the application of the Kansas Telephone Co. for permission to abandon its exchange at Piper, and connect the subscribers to the exchange at Bonner Springs.

December 28: Hearing at Plains on the application of the Plains Telephone Co. for permission to increase its rates for service at Plains.

January 4: Hearing at Gorham on the application of the Gorham Telephone Co. for permission to change its rates for service at Gorham.

January 8: Hearing at Wakefield on the application of the Wakefield District Telephone Co. for permission to change its rates for service at Wakefield.

January 8: Hearing at Clyde on the application of the Central Kansas Telephone Co. for permission to change its rates for service at Clyde.

January 9: Hearing at Riley in the matter of the complaint of the Riley Rural Telephone Co. against the Farmers Mutual Telephone Co. at Leonardville, Wm. Bohnen Blust, president, and the Midland Telephone Co. at Leonardville, John Nordstrum, president.

January 9: Hearing at Allen on the application of the Kansas Telephone Co. for permission to consolidate its exchange at Chalk Mound with the Allen Telephone Exchange at Allen.

January 12: Hearing at Longton on the application of the Longton Telephone Exchange for permission to change its rates for service at Longton.

MINNESOTA.

December 4: Order made on May 24, 1928, granting the application of the New Richland Telephone Co., annulled, vacated and set aside, and petition for the New Richland company for an increase of rates denied.

December 18: Hearing at Avon in the matter of the application of the Northwestern Bell Telephone Co. for authority to increase its rates for exchange service of its exchange at Avon.

December 18: Hearing at Holdingford in the matter of the application of the Northwestern Bell Telephone Co. for authority to change and increase its rates for service of its exchange at Holdingford.

MISSOURI.

November 30: General exchange tariff of the Middle States Utilities Co. of Mo. approved and authorized to be put in force on January 1, 1929. The company operates exchanges at Baring, Bethany, Blythedale, Brimson, Cainsville, Cameron, Edinburg, Gilman City, Goshen, Hamilton, Hartford, Jamesport, Kahoka, Kingston, Lawson, Mercer, Memphis, Mill Grove, Modena, Mt. Moriah, Nettleton, Princeton, Ridgeway, St. Patrick, Unionville, Wayland and Winston.

December 3: Application granted of Arthur Rice to sell and Haston Allen to buy the Rice Telephone Co., operating exchanges at Alton and Thomasville, for the sum of $4,500.

December 5: West Plains Telephone Co. authorized to file with the commission a schedule of increased rates for service as asked.

NEBRASKA.

December 4: In the matter of the application of the Odell Telephone Co. for authority to charge gross and net rates; request found to be reasonable and in accord with the best standard practices, and permission granted.

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December 4: Complaint of H. J. Haines against the Curtis Telephone Co., alleging unsatisfactory service, dismissed.

December 6: Application of the Calloway Telephone Co. for permission to make a charge of 10 cents for local calls, dismissed on request of applicant.

December 6: Complaint of Henry George against the Eustis Telephone Co., alleging unsatisfactory service, dismissed.

December 8: In the matter of the application of the Lincoln Telephone & Telegraph Co. for authority to increase rates at its Wymore exchange; ordered that the company be authorized to charge $3.75 for business service instead of $4 as requested; in all other respects application granted and order issued permitting amended schedules to become effective as of December 1.

NEW YORK.

December 3: The General Telephone Utilities Co., of Chicago, Ill., a Delaware corporation, made application for authority to acquire all of the capital stock of the Glen Telephone Co., serving Gloversville, Johnstown and other parts of Fulton and Montgomery counties, at the price of $250 per share. There are 9,000 shares of the capital stock of the Glen company, par value $100 a share.

The petitioner states that it owns wholly or in part telephone companies in Pennsylvania and Michigan, and the Black River Telephone Co., serving Lewis county and parts of adjoining counties, the latter through purchase by the Glen Telephone Co., and that it desires to place the two New York state companies under one management as well as some smaller telephone companies in the state which are not under the commission's jurisdiction.

OKLAHOMA.

December 12: Hearing in the matter of the complaint of the University School Exchange vs. the Southwestern Bell Telephone Co., alleging refusal of long distance service unless a deposit of $25 is made.

December 12: Hearing in the matter of the Oklahoma Telephone Co. vs. the Chase Telephone Co. and Garden City Telephone Co. alleging invasion of territory.

December 12: Hearing on the application of the Oklahoma Telephone Co. to increase its exchange rates at Hominy.

December 12: Hearing on application of Oklahoma Telephone Co. to increase exchange rates at Broken Arrow.

PENNSYLVANIA.

December 5: Hearing at Harrisburg in the complaint of the city of Johnstown and allied municipalities against the Johnstown Telephone Co., regarding the increase in rates which became effective in Johnstown on April 1, 1927.

WASHINGTON.

November 26: Hearing held on application of Chehalis and Centralia petitioners asking that the telephone toll between the twin cities be eliminated.

It is understood that the toll will not be eliminated, but will be cut more than in half as the result of the hearing. The present toll charge is ten cents for three minutes' conversation with five cents for each additional minute. The new rate will be five cents for the first five minutes and five cents for each additional five minutes.

WISCONSIN.

November 30: The Wisconsin Telephone Co. authorized to discontinue its present schedule of rates at Whitewater and place in effect the rates proposed in its application except for several classes of service enumerated in the commission's order.

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